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राज्य सरकार तथा अन्य राज्य-प्राधिकारियों द्वारा जारी किये गये
कानूनी आदेश तथा अधिसूचनाएं।

स्वायत्त शासन विभाग

अधिसूचना

जयपुर, सितम्बर 09, 2025

एस.ओ.25 :-राजस्थान सरकार केन्द्रीय अधिनियम, 1948 की धारा 29 की उप-धारा (2) के अन्तर्गत प्रदत्त शक्तियों का प्रयोग करते हुये राज्यपाल महोदय की आज्ञा से यह आदेश जारी किया जाता है कि "राज्य सीवरेज एवं वेस्ट वाटर पॉलिसी-2025" मुख्य विषय वस्तु "सीवरेज एवं वेस्ट वाटर" राजस्थान राज्य कैबिनेट मीटिंग दिनांक 31.08.2025 से स्वीकृत होकर प्रभावी हो गयी है।

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रवि जैन,

शासन सचिव,

स्वायत्त शासन विभाग।

ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BIS	Bureau of Indian Standards
BOD	Biochemical Oxygen Demand
BOO	Build Own Operate
BOT	Build Operate and Transfer
CER	Certified Emission Reduction
CGWA	Central Ground Water Authority
COD	Chemical Oxygen Demand
CPHEEO	Central Public Health and Environmental Engineering Organization
CPCB	Central Pollution Control Board
CSP	City Sanitation Plan
DBFOT	Design-Build-Finance-Operate-Transfer

DLB	Directorate of Local Bodies
DPR	Detailed Project Report
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge and Septage Treatment Plant
EOI	Expression of Interest
GIS	Geographical Information System
GPR	Ground Penetrating Radar
GoI	Government of India
GoR	Government of Rajasthan
GST	Goods and Services Tax
HUDCO	Housing &Urban Development Corporation Limited
IIT	Indian Institute of Technology
lpcd	Liters per capita per day
LSG	Local Self Government Department, GoR
mm	Millimeter
MoHUA	Ministry of Housing and Urban Affairs
NCR	National Capital Region
NGO	Non-Government Organization
NMSA	National Mission for Sustainable Agriculture
NIT	National Institute of Technology
O&M	Operation & Maintenance
PPP	Public Private Partnership
RBMC	Revenue Based Management Contract
REC	Renewable Energy Certificate
RSPCB	Rajasthan State Pollution Control Board
RTPP	Rajasthan Transparency in Public Procurement
RUDSICO	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation
RUIDP	Rajasthan Urban Infrastructure Development Project
SBM	Swachh Bharat Mission
SLNA	State Level Nodal Agency
SS	Suspended Solids
SPS	Sewage Pumping Station
SPV	Special Purpose Vehicle
SRTW	Safe Reuse of Treated Water
STP	Sewage Treatment Plant
STW	Secondary treated Used Water
TUW	Treated Used Water

TTW	Tertiary Treated Used Water
TWW	Treated Waste Water
UDH	Urban Development & Housing Department
UIT	Urban Improvement Trust
WHO	World Health Organization

1. BACKGROUND

Sanitation is defined as safe management of human excreta, including its safe confinement treatment, disposal and associated hygiene-related practices. While this policy pertains to management of human excreta and associated public health and environmental impacts, it recognizes that the integral solutions need to take account of other elements of environmental sanitation, i.e. solid waste management, generation of industrial and other specialized/ hazardous waste, drainage, and also management of drinking water supply. The State of Rajasthan has issued guidelines for 'State Urban Sanitation Policy' with a view that all cities & towns of Rajasthan become totally sanitized, healthy and livable so that all urban dwellers have access to and use safe and hygienic sanitation facilities. In order to achieve this goal, 100% human excreta and liquid wastes from all sanitation facilities, including toilets, kitchen and bathroom must be disposed off safely. Disposal of waste water generated from cities or from industrial areas is a big challenge not only for Rajasthan state but also at national level. Treated wastewater generated from existing wastewater treatment plants can be considered as an important component of water resources of Rajasthan. Due to the terrain and the concentration of the urban population, the majority of treated wastewater is discharged into various rivers, nalahs or on open land and only a part of it is used for irrigation/industry/landscaping.

India is also signatory to the '2030 Agenda for Sustainable Development', adopted at the Sustainable Development Summit of the United Nations in September 2015. It comprises of 17 Sustainable Development Goals (SDGs). Of these, 3 SDGs namely SDG 6: Clean Water and Sanitation- Ensure availability and sustainable management of water and sanitation for all, SDG 11: Sustainable Cities and Communities- Make cities and human settlements inclusive, safe, resilient and sustainable, and SDG 12: Responsible Consumption and Production- Ensure sustainable consumption and production patterns, are directly related to sanitation sector. This also obligates Government of India as well as State Governments to develop strategies to cover entire population with sanitation facility by year 2030. Rajasthan state sewerage and waste water policy-2016 already laid framework for achievement of SDG goals.

State Sewerage & Waste Water Policy-2016 was framed to resolve the following key issues:

1. Provision of adequate wastewater collection and treatment facilities for all the cities and towns in Rajasthan.
2. Protection of the environment and public health in the areas affected by the proposed systems especially, surface water and ground water.
3. Consideration of treated effluents as a source for reuse (irrigation/ industrial/landscaping).
4. Improvement of the socio-economic conditions in the areas to be served by the proposedsystems.

Since adaptation of this policy, significant positive changes have occurred in the waste water scenario of the State. However, some of the issues and challenges faced in the waste water sector still continue and require policy reforms. With this background, the State has revised its State Sewerage & Waste Water Policy-2016 for addressing state-specific concerns from new/amended national level policies/guidelines/advisories, to incorporate progress achieved during implementation of this policy and technology advancements since 2016 and to achieve SDG goals.

1.1 Goal and Vision of the Policy:

Vision:

"All cities of Rajasthan to be covered with comprehensive wastewater management services with a focus on health, hygiene, sustainability, circular economy principles and optimal resource recovery through reuse and recycling of treated waste water in agriculture, industrial, urban uses and natural ecosystems"

The above vision builds upon the existing National Policy/Missions/State schemes:

- The National Urban Sanitation Policy 2008, envisions, **"All Indian cities and towns become totally sanitized, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens, with a special focus on hygienic and affordable sanitation facilities for the urban poor and women".**
- SBM-U2.0 envisions, **"all used water including fecal sludge, especially in smaller cities (population less than 1.0 lakh) are safely contained, transported, processed and disposed so that no untreated fecal sludge and used water pollutes the ground or water bodies."**
- AMRUT-2.0 Mission launched in October, 2021 envisions **for providing universal household coverage of sewerage/septage services in AMRUT Towns and aims to recycle/re-use of treated used water.**
- **Deen Dayal Upadhyay Sahari Vikas Yojna (DDUSVY)**, which envisions **for inclusive development of urban areas by developing comprehensive wastewater and storm water management systems including sewerage, drainage, sanitation services, treatment and environment friendly treated waste water reuse/disposal in all ULBs in next 7 years**. It shall fill the infrastructure gaps, enhance service delivery of existing system and bring qualitative improvement.

The State Sewerage and Waste Water Policy is to ensure improved health status of urban population, specially the poor and under privileged, through the provision of sustainable sanitation services and protection of environment by providing universal household coverage of sewerage/septage services and this policy aims to achieve optimal resource recovery from waste water, optimal reuse/recycle of treated used water in Nature/Agriculture/Industrial/Municipal purposes by considering circular economy and sustainability. The policy specifically endorses the following core principles:

(i) To protect public health, environment and water resources.

(ii) To promote proper functioning of network-based sewerage systems and ensure connections of household to prevent dry weather flow in drains & streets.

(iii) Treatment of sewage and sludge is required prior to discharge into the environment.

(iv) Promote recycling & re-use of treated sewage for non-potable applications.

(v) To make Sewerage/Septage project economic, social and environmentally sustainable.

(vi) Inclusive, transparent and participatory decision making processes to achieve socio-environmental as well as economic & financial objectives.

(vii) Capacity building for enhanced institutional ability to govern the sector effectively.

(viii) Ensuring, protecting and optimizing investments.

(ix) Public Private Partnership (PPP) in the most appropriate manner.

(x) Public outreach for environmental and health related outcomes.

(xi) Establishment of an efficient, effective, affordable and accountable system for managing urban sewerage and septage management.

(xii) Effective monitoring and evaluation of the initiatives intended to improve sewerage and septage management services.

(xiii) Coverage of all citizens in the urban areas for service provisioning.

(xiv) Adequate sewerage and Septage facility provided to all urban customers

(xv) Equity across geographical as well as demographic fabric of the customer base.

(xvi) Ensuring proper rehabilitation of old existing sewer network by suitable technology

(xvii) Ensuring the system's financial sustainability in a progressive manner through improved efficiency, tariff rationalization and corporatized operations there by decreasing dependence on unsustainable resources.

(xviii) Improved service levels in a well-defined and phased manner by ensuring interventions in the spheres of infrastructure, institution, autonomy and management, monitoring mechanism and regulatory framework.

(xix) To reduce the volume of wastewater produced by awareness for using water efficient fixtures.

(xx) Ensuring effective treatment of sewage as per standards prescribed by Regulatory Authorities and its real time monitoring through OCEMS, SCADA and other advanced IT based tools.

1.2 Model ULB and award scheme

The concept of "Model ULBs" in sewerage management may be incorporated to showcase best practices across the State. To promote innovation and adoption of best practices in sewerage management, the policy shall incorporate the concept of Model ULBs, inspired by similar initiatives under the Swachh Bharat Mission (Urban) and the Namami Gange Programme, where model GPs and model wards have been developed to demonstrate effective sanitation and wastewater management. These units will serve as learning sites, and their success stories will be documented and scaled up across the State. Incentive-based recognition may also be considered to encourage replication.

An award scheme for the best performing municipal STPs and FSTPs may be introduced in collaboration with the RSPCB to promote excellence in operation and maintenance.

To incentivize improved operational performance and sustainability of treatment facilities, the policy shall introduce an annual award scheme for best performing municipal STPs and FSTPs in collaboration with the Rajasthan State Pollution Control Board (RSPCB). The scheme will be aligned with mechanisms such as Swachh Survekshan (MoHUA) and the AMRUT performance benchmarking framework, where operation & maintenance indicators are used for ranking ULBs.

Performance of facilities will be evaluated through jointly developed criteria (effluent quality, timely reporting, reuse %, energy efficiency etc.), and top-performing plants will be recognised and publicly rewarded to encourage replication of good practices across the State.

1.3 Environmental audits of STPs

Environmental audits of STPs may be carried out to assess issues related to treatment efficiency and the supply of TWW for reuse. To ensure sustained efficiency of treatment plants and reliability of treated waste water (TWW) for reuse, the policy shall mandate periodic environmental audits of all municipal STPs.

These audits will be conducted in coordination with the State Pollution Control Board, following the practices adopted under the CPCB "Performance Evaluation of STPs" guidelines, and will focus on treatment efficiency, compliance with discharge standards and identification of operational gaps.

The audit findings will be used to prepare corrective action plans and facilitate continuous improvement and safe reuse of treated water.

1.4 Validity period and review criteria of the policy

To ensure effectiveness and relevance over time, the policy shall remain valid for an initial period of 5 years (i.e. 2030), after which it will be reviewed and updated based on implementation experience and emerging sectoral needs.

A mid-term review (after 2–3 years) will also be undertaken in consultation with key stakeholders, to assess progress, identify bottlenecks and incorporate any necessary modifications.

The review will be coordinated by the State Urban Development Department in association with RSPCB and nodal ULBs, and will include performance evaluation, gap assessment and necessary policy revisions.

2. NEED FOR STATE SEWERAGE AND WASTE WATER POLICY

Safe water supply and hygienic sanitation facilities are the two basic essential amenities the community needs on top priority for healthy and livable life. While provision of safe drinking water takes precedence in the order of provision of basic amenities to community, the importance of safe handling of the water that comes out of houses in the form of waste water which unless properly collected, conveyed, treated and safely disposed off may eventually pollute our precious water resources and cause environmental degradation. Both provision of safe drinking water and safe disposal of waste water have to be handled simultaneously in order to achieve healthy and livable life.

In most of the cities and towns of Rajasthan, small fraction (less than 30%) of households is connected to a sewerage system and waste water from these households is treated effectively at Sewage Treatment Plants. The rest of the urban population has either:

(i) Some form of on-site sanitation like septic tank/soakage well for disposal of human excreta at irregular emptying frequency and improper disposal of emptied septage polluting the environment

(ii) Kitchen & bathroom waste disposing into road side drains or directly on roads, thereby creating unhygienic conditions

Major towns, mostly divisional headquarter towns are having sewerage system almost 50 years old and facing rehabilitation issues. It is important to handle these issues with best suitable technologies – open cut/ trenchless (pipe bursting, use of liners etc).

The operative sewerage disposal systems constructed in various cities and towns of Rajasthan are generally in a fair condition and in a continuous state of operation, however there are problems due to the insufficient institutional back up, insufficient funds for operation and maintenance, lack of sense of public ownership resulting in lack of involvement of beneficiaries in the upkeep of the system, and lack of well qualified and trained personnel. It may also be better to go moderate if needed, to ensure success of projects delivering full benefits. Therefore, there is also a need to measure sustainable institutional structure.

The situation in Rajasthan is almost similar to the situation of the rest of India, where, only 40% of urban population in India is serviced with sewerage system and the remaining 60% of the urban population is dependent on sub-optimally regulated On-site Sanitation systems. Therefore, it is imperative that the existing policy has to be updated and tangible action plans for the planning, implementation and management of sanitation sector have to be formulated.

While formulating this policy, the need for a separate storm water drainage policy has also become evident.

This policy is relevant at two levels – the macro and the micro.

Macro level: At the macro level, there is a need to manage the macro economy of the area and to protect the environment and manage the socio-economic development, where the State Government should set/amend a macro policy, broad objectives and principles of which should be:

(i) A frame work within which the municipalities are guided to work, and

(ii) A benchmark against which municipalities are aware that they must measure up for approval of their projects for financing.

Micro level**:** As per the Constitution of India and its 74th amendment, prime responsibility for installing and operating a sanitation service lies with the individual Municipal Bodies. Each Municipal Government should determine its own policy for a sanitation service at the micro level within the frame work of the guidelines established in the macro policy formulated by the State Government.

3. OBJECTIVES

The policy lays down the following main objectives waste water treatment and resource recovery:

(i) To ensure 100 percent household coverage with wastewater (black and grey water) treatment facilities for healthy and livable life.

(ii) To attain coverage of 100% of the area with wastewater (black and grey water) treatment facilities and collection of black/grey water in all the towns

of the State.

(iii) To attain a level of 100% treatment of collected sewage as per prescribed CPCB/NGT standards with circular economy concept for handling and treatment of sewage and sludge.

(iv) To increase the ground water table by reducing city/industrial water demand (being met with potable water) with the help of reuse of treated waste water especially focusing on newly urbanizing pockets and industrial areas.

(v) Reuse 100% of Treated Used Water which ensures resource conservation & preservation of sensitive eco-system and reducing pollutant loading. Pure water is available in scarce quantity whether from ponds, tube wells etc and the shortage becomes acute during summer. Therefore, reuse of treated sewerage can provide incremental supply for non – potable applications and thus reduce need for augmenting supplies. In other words, water reuse promotes environmental sustainability by reducing burden on already stressed basin and aquifers and preventing their depletion.

(vi) Scientific disposal of the remaining Treated water (if any).

(vii) To make urban wastewater sector self-sustainable with an integrated approach by increasing resource recovery in terms of energy, treated used water and other resources.

(viii) Promotion of R&D activities in wastewater treatment and sludge handling technologies.

4. LEGISLATION AND GUIDANCE DOCUMENTS

The Government Sewerage and Waste Water Policy should be read in accordance with the most current versions of the following, legislations and documents:

(i) The water (Prevention and control of pollution) Act, 1974.

(ii) The water (Prevention and control of pollution) Rules, 1975.

(iii) The water (Prevention and control of pollution) cess Act, 1977.

(iv) The water (Prevention and control of pollution) cess rules, 1978.

(v) Environmental (Protection) Act, 1986.

(vi) The Environment (Protection) rules, 1986.

(vii) The Constitution (Seventy Forth Amendment) Act, 1992

(viii) National Environment Tribunal Act, 1995

(ix) National Environment Policy, 2006

(x) Environment Impact Assessment Notification, 2006

(xi) National Urban Sanitation Policy 2008.

(xii) Rajasthan Municipalities Act, 2009

(xiii) Rajasthan state environment policy-2010

(xiv) Township Policy, 2010

(xv) State Water Policy, 2010

(xvi) National Green Tribunal Act, 2010

(xvii) National Green Tribunal Act (Practice and procedure) Rules, 2011

(xviii) National Water Policy, 2012

(xix) Latest Manual on Sewerage and Sewage Treatment Systems, 2013.

(xx) Prohibition of Employment of Manual Scavengers and their Rehabilitation Act, 2013

(xxi) Solid Waste Management Rules, 2016

(xxii) Bio Medical Waste Management Rules, 2016

(xxiii) Hazardous and other waste (Management and transboundary Movement) Rules, 2016

(xxiv) National Fecal Sludge and Septage Management Policy, 2017

(xxv) The Wetlands (Conservation & Management) Rules, 2017

(xxvi) Rajasthan Building Bye-laws, 2020

(xxvii) AMRUT-2.0 Guidelines, 2021

(xxviii) Swachh Bharat Mission Urban-2.0 Guidelines, 2021

(xxix) National Framework for Safe Reuse of Treated Water, 2022

(xxx) State Climate Change Policy, 2023

(xxxi) Quality standards suggested by Central Pollution Control Board and Rajasthan State Pollution Control Board.

(xxxii) Standards set by Bureau of Indian Standards (BIS).

(xxxiii) Effluent Quality guidelines for health protection measures in aquaculture use of waste water.

(xxxiv) Quality guidelines for health protection in using human wastes for aquaculture.

(xxxv) Service Level Benchmarks Fixed by Ministry of Urban Development.

(xxxvi) Hon'ble Supreme Court/Hon'ble High Court/Hon'ble NGT Orders/Decisions

(xxxvii) Plastic Waste Management Rules, 2016

(xxxviii) E-waste Management Rules, 2022

5. THE POLICY

5.1 On Resource Development

Wastewater is a perennial water source and shall form an integral part of renewable water resources and the State water budget. The other important resource in the wastewater is energy and with proper design and efficient management of wastewater system and treatment the wastewater sector can lead towards climate neutrality. There are also other resources in the wastewater. Therefore, each local body will consider it as a resource and make the plan for the optimal resource recovery from the wastewater such as reuse treated used water for Nature/Agriculture/Industrial/Municipal purposes, energy and other resources as per the site conditions with social, environmental and economically sustainable for healthy and livable life and environment.

Collection and treatment of wastewater is a necessity to circumvent hazards to the public health and the environment. It becomes imperative when contamination of freshwater resources with wastewater is imminent. All local bodies will make city sanitation plan (CSP) for a period of 30 years considering future development and city development in line with city Master Plan to avoid any conflicts in developing the city in the future. The cities which do not have CSP may prepare a short term plan of 5 years from the base year for immediate implementation as per guidelines provided in Manual on Sewage Treatment System, published in 2013 by the Ministry of Urban Development, Government of India to address the issues of utmost importance and then ULBs may prepare CSP for 30years. The CSP should also be in line with the guidelines of Swachh Bharat Mission. Collection and treatment of wastewater is mandatory to protect public health against water borne diseases, and where epidemics may become a threat otherwise.

Existing levels of wastewater services shall be maintained and upgraded where necessary to protect public health and the environment and a separate plan is to be prepared by local body as per their requirement.

Handling and treatment of wastewater shall be designed with Circular economy concept to promote optimal resource recovery from the wastewater such as reuse treated used water for Nature/Agriculture/Industrial/ Municipal purposes, energy and other resources. In case of producing an effluent fit for reuse in irrigation, this has to be done in accordance with WHO guidelines as a minimum requirement. Reuse of treated wastewater for other purposes shall be subject to appropriate specifications.

Coordination shall be maintained with the official bodies in-charge of urban development to account for the treatment and disposal of their liquid wastes. Central treatment plants shall be built to serve semi-urban areas, and collection of waste water can be made initially through trucking until collection systems are justified. Furthermore, Fecal Sludge Treatment Plants (FSTPs) proposed in urban areas shall be designed to not only handle urban waste but also to collect, transport, and treat fecal sludge from adjoining non-urban areas. This will enable the development of a comprehensive and integrated septage management system across the entire cluster.

Specifications and minimum standards as stipulated by CPHEEO will be applicable for the use of septic tanks in urban areas. Particular attention be given to the protection of underlying aquifers.

5.2 On Resource Management

It is highly imperative that Urban Local Body shall develop and manage wastewater systems as well as the treatment facilities and design the system in a way to promote optimal resource recovery from wastewater with circular economy concept such as treated used water for Nature/Agriculture/Industrial/Municipal purposes, energy, sludge and other resources.

Effluent quality standards shall be defined based on the quality parameters required for end users and to achieve these standards the best attainable treatment technologies should be adopted. Key factors will include the location of the discharge, its proximity to wells, the type of receiving water, and the nature and extent of end users. Wastewater intended for irrigated agriculture will be regulated based on the soil characteristics of the irrigated land, the type of crops grown, the irrigation schedule and methods, and whether other waters are mixed with the treated wastewater.

Wastewater from industries with significant pollution should be treated separately to standards allowing its reuse for purposes other than irrigation or to allow its safe disposal.

Industries shall be encouraged to recycle its treated effluent in accordance to guidelines issued by CPCB to implement the Zero Liquid Discharge from industries. Zero Liquid Discharge also needs to reinforce the requirement for no mixing of industrial used water with municipal used water.

Industrial areas not located on RIICO-designated land shall be brought under the purview of proper industrial waste treatment by the Urban Local Bodies (ULBs). To facilitate this, construction of Common Effluent Treatment Plants (CETPs) or Effluent Treatment Plants (ETPs), along with the development of the necessary conveyance network would be taken up in a planned manner.

It is noted that in certain cases industrial waste water enters in domestic waste water systems. It affects the biological activities of waste water treatment plants which runs on biological treatment process. The efficiency of waste water treatment plants gets affected adversely and effluent of such waste water treatment plants pose environmental hazards. Steps would be taken to ensure that there is proper enforcement to stop such activity.

Consideration shall be given to isolate treated wastewater from surface and ground water used for drinking purposes and to the blending of treated effluent with relatively fresh water for suitable reuse.

State authorities can co-create/collaborate with global institutes/authorities. Urban Local Bodies can engage Experts from faculty of Engineering of Rajasthan government aided Universities/Government Engineering Colleges of Rajasthan/IITs/NITs for seeking technical advice/consultancies.

Conditional Assessment and Rehabilitation of old existing defunct sewerage network:
Conditional Assessment:

To ensure sustainable urban sanitation infrastructure, it shall be mandated that a comprehensive conditional assessment of the existing sewer network is undertaken periodically by the responsible Urban Local Bodies (ULBs) or designated authorities. This assessment will serve as a foundational tool for strategic planning, maintenance and rehabilitation of sewerage systems.

(i) To evaluate the structural condition, hydraulic efficiency, and functional adequacy of existing sewer infrastructure, thereby enabling data-driven interventions for asset management.
(ii) The assessment shall cover pipelines, manholes, pumping stations, and associated structures within the jurisdiction of the ULB or applicable authority.

Rehabilitation of old existing defunct sewerage network:

To improve urban sanitation and reduce environmental and public health risks, a focused policy shall be adopted for the rehabilitation of old, deteriorated, and defunct sewerage networks within urban and semi-urban areas to restore and upgrade aging and non-functional sewerage infrastructure to ensure efficient collection, conveyance, and treatment of wastewater.

This provision applies to all sewerage systems that are:

(i) Non-operational or partially functional
(ii) Structurally compromised or hydraulically inadequate
(iii) Constructed using outdated technologies
(iv) In areas experiencing frequent blockages, overflows or infiltration

Rehabilitation Measures:

(i) Trenchless technologies (CIPP/MWSL, pipe bursting etc.) shall be promoted

for minimal disruption in urban areas.

(ii) Where required, complete replacement of damaged sections shall be undertaken.

(iii) Capacity augmentation may be included based on future urban growth projections.

5.3 On Wastewater Collection and Treatment

(A) City Plan

A proper and updated city plan is an essential pre-requisite for proper planning and design of all utilities and more so for the Sewerage Systems. The State shall endeavor to have proper digital city maps showing the levels prepared through modern available technology. The digital city maps should clearly show the city features over ground and underground including all utilities. Tools like Geographical Information System (GIS), Ground Penetrating Radar (GPR), Total station etc. may be used for preparation of city map. The city maps should be updated every 10 years. An effective and comprehensive GIS based data base and Management Information System correctly mapping the assets, user base and status of operations shall be established.

(B) Design Period

Every city has to prepare a City Sanitation Plan (CSP) for next 30 years along with 5 years short term plan as per the guidelines of CPHEEO manual on sewerage published in 2013. The City Sanitation Plan (CSP) for the city should take into account the likely changes in the city in next 30 years and plan for them and will be according to city Master plan. The Detailed Project Report (DPR) for sewerage should be in accordance to City Sanitation Plan. The design of the sewers and planning of space should be for the 30 years projection requirements. However, the units which can be developed in modules (e.g. Sewage Treatment Facility, sewerage Pumping machinery, on-site treatment facilities, etc.) can be designed for appropriate shorter period as stipulated in CPHEEO manual. Earmarking of land for Sewage Pumping Station (SPS) and Sewage Treatment Plant (STP) should be done for all Urban Local Bodies (ULBs) and appropriate land allotment shall be done by Development Authority/Urban Improvement Trust/State Govt. on priority.

(C) Priority of Sanctioning Sewerage Projects:

Priority for the work of laying sewerage network & connectivity (mandatory) and construction of STPs would be taken in a phased manner to provide full 100% coverage of town.

The priority for sanction of sewerage project will be:

(i) Cities with water supply service level equal to or more than 135 lpcd. Full coverage is to be provided in these cities.

(ii) District Head Quarter not covered by Sewerage System.

(iii) NCR Town/Heritage/Tourism/Water body town not connected by Sewerage System.

(iv) Other cities not connected with Sewerage System having population more than 50,000.

(v) Not fully connected on the basis of coverage.

(D) Waste Water Management for Sustainable sanitation

A. Feasibility of Sewerage Network

Gravity sewers shall be designed for achieving self-cleansing velocity to avoid deposition of suspended solids and organic matter in the sewer line. Therefore, following criterion shall be followed while deciding feasibility of laying of conventional sewerage network:

1. Water Supply Level should be equal to or more than 135 LPCD
2. Population density should be equal to or more than 100 persons per hectare

Storm water run-off also gathers impurities during its flow and becomes waste water. However, its characteristics are very much different from domestic sewage, hence required to be handled separately. Therefore, storm water drainage system should be developed separately and shall have separate system of disposal through rainwater harvesting. There should not be any short-circuiting or connectivity between waste water/sewerage system and storm water drainage system, otherwise it will lead to entry of solid waste into waste water system, resulting in choking and overflow of sewers/conduits.

Each house shall have two separate outlets, one for waste water from kitchen, bathroom and toilets contributing to waste water conveyance System, while the other from rooftop and open area contributing to storm water system. Both the conveyance system shall be continuous without any breakage and shall have different disposal system. Disposal of waste water shall be in waste water treatment plant and there will be a subsequent reuse system for treated waste water. Disposal of storm water from all open areas of city shall be at rainwater harvesting systems located locally, which receive rain water after its appropriate treatment. In both the cases treatment to appropriate degree is mandatory.

B. Types of Waste Water Management for sustainable sanitation

There are two types of sanitation in waste water management: On Site Sanitation and Off-Site Sanitation. There may be hybrid system also.

a. On Site Sanitation

At present about 60% of country population is dependent on one or another form of on-site sewage management system. Since coverage of entire population with sewerage system is still a distinct dream, it is important to strengthen existing on-site sewage management systems to comply with various regulatory disposal norms. There are three major parts of on-site sewage management:

(i) On-site sewage management is being dealt with involving **Conventional Septic tank with soaking options and other advance systems**.

(ii) **Faecal Sludge and Septage Management:** On-site sewage treatment methods invariably generate faecal sludge or septage which need to be safely collected, transported, treated and reuse/disposed off. Methods which may be adopted for proper management of Faecal Sludge & Septage collected from onsite sanitation systems to eliminate the problem of open discharge of Faecal Sludge & Septage into the environment may be **(1) treatment at newly constructed standalone faecal sludge treatment plants (FSTPs) or (2) co-treated at existing STPs in the vicinity. By-products obtained from above process may be reused/recycled.**

(iii) **Grey water (Sullage)** in the areas covered with on-site sanitation shall be collected and treated separately by establishing treatment plants as per CPHEEO guidelines.

On-site sanitation causes passing of the chemical and pathogenic infections to the ground waters, to the drains and water bodies, outside resulting in severe risk to human health. Therefore, followings points have to be considered in this matter:

i. Sanitary on-site options can be adopted after suitable investigation and care. There is a very strong case for adopting a suitable on-site option for the areas that cannot meet the requirements of 5.3.

ii. The options of the onsite system will depend on the substrata, space availability and social acceptability. These also are dependent upon the water absorption capacity of the soil. Rocky areas and high water table areas are not suitable for this at all as they do not provide any protection against the pathogens. It is generally suggested that the risk factor for pollution is related to the traverse time between polluting point and the water table. A traverse time of 50 days is considered low risk, 25-50 days is to be considered as medium risk area and less than 25 days is considered as high risk areas with the point of view of pollution of the ground water. Finer soils with high clay content have low permeability and thus greater risk reduction in lesser depths whereas coarse sands and rocky fissures provide high permeability and lower reduction. Generally, a minimum distance of 2 to 3 m is required for risk reduction.

iii. The on-site option for solids removal combined with carriage of the sewage through conduits to the general sewerage system can also be considered as a good option in critical areas. Such options could be a combination of small bore/shallow sewers for sewage collected after settling of solids in a tank (e.g. septic tank effluent) and in site disposal systems.

iv. A properly managed on-site sanitation system [e.g. septic tank + soak pit] coupled with sanitation value chain offers a feasible and affordable solution. Due to low population density in periphery to core city areas and in smaller towns, this approach improves sanitation and hygiene to a significant extent. Further, to safely manage such grey water/ overflow of septic tanks, localized off-site sewage treatment systems offer economical solution. Above combined approach of on-site & off-site sanitation offers a medium term (5 to 15 years) complimentary plan to sewerage system and is helpful for ULBs to meet regulations on sewage management economically. At later stage, the areas covered under the combined approach of on-site & off-site sanitation, can be increasingly covered with Sewer Networks and STPs, depending on availability of resources.

v. All on site options must be adopted after full involvement of the local users who know all the feasible options and must have a say in the choice. Assistance of NGOs and dedicated organizations for this option should be encouraged.

vi. On Site technologies represent viable and affordable options if collection, transport, treatment and safe end use or disposal is managed properly.

vii. Technology based on-site solution accompanied by root zone treatment can be suitably used for onsite sanitation. Reed Bed filters, horizontal or vertical, can be deployed before final disposal / Re-use.

viii. The ULB through its suction machines shall facilitate the clearance of sludge on payment basis. Municipality can also authorize any private person/Agency

for clearance of sludge through mechanical means.

ix. ULBs shall explore the possibilities for septage management of nearby semi-urban or peri-urban areas at underutilized wastewater treatment facilities (FSTPs/STPs) developed in Urban area before achieving full design capacity to strengthen onsite sanitation in these areas. ULBs shall decide conveyance charges and user charges for collection and treatment of septage.

b. Off – Site Sanitation

The ideal mode for sanitation is an off-site system which collects all the waste from within the city and transfers it to a treatment facility which treats it to acceptable levels of effluent and sludge which is then disposed/reused.

The offsite sanitation may be **Centralized or Decentralized**. In centralized offsite sanitation, sewage is transported either through gravity or pumping to a centralized treatment facility, which may be ideally located outside the city. In decentralized offsite sanitation system, treatment plants are located in each drainage zone to have transportation of sewage through gravity. A hybrid approach may be adopted based on economics.

The essential pre-requisites to a sustained functioning of the off-site facilities are:

i. Adequate sewage flow (approximately 100 lpcd minimum) which is possible only in town/areas with a minimum water supply of 135 lpcd and 100% connectivity.

ii. Availability of Land for Sewage Treatment Plant and Pumping Stations will be ensured while preparing the master plan of sewerage for town. Town planning department shall mandatorily earmark land for Sewerage Treatment Plant and other facilities. The Department, Authorities/UITs/State Govt. shall allot a land to ULBs for sewerage projects.

iii. Where possible, gravity flow shall command the collection and conveyance lines.

iv. Treatment plants shall be located away from any potential population growth. Location selection shall be coordinated and approved with the concerned governmental agencies. Due consideration shall be given to interact with landowners and adjacent communities.

v. It is mandatory to construct decentralized Sewage Treatment Plants (STPs) for the treatment of waste water in high rise buildings, so that sewerage system in that area may function properly and the treated waste water may be utilized in the nearby area. It will also reduce the investment requirement of sewerage system.

vi. Development Authorities and Urban Local Bodies (ULBs) shall mandate that all large residential societies and group housing developments located in urban/semi-urban areas establish decentralized wastewater treatment facilities within their premises. The treated wastewater shall be compulsorily reused for non-potable applications such as landscaping, horticulture, and dual plumbing systems for flushing purposes.

vii. The use of advanced wastewater treatment technologies shall be endorsed and encouraged. However, appropriate wastewater treatment technologies

shall be selected with due consideration to operation and maintenance costs and energy savings, in addition to their efficiency in attaining and sustaining quality standards.

viii. Waste water treatment plants should be designed to make them energy neutral by using optimal methodology of energy efficient instruments, producing electricity from solar panels/bio-gas and CNG gas from bio-gas.

ix. Innovative approaches to wastewater treatment, particularly for the small municipal systems have to be considered. Design criteria, performance specifications and guidelines for such systems shall be adopted and generalized.

x. Design and performance specifications of wastewater treatment plants shall be as per guidelines given in the CPHEEO manual. Sufficient room in tendering for the construction of new plants shall be provided for competition to take place in both technologies and costs.

xi. Sewage Treatment Plants should be designed for effluent parameters as per requirement for reuse of treated used water.

c. Hybrid System:

Most of the urban areas and rural areas of Rajasthan is having water supply service levels less than 135 lpcd (feasibility requirement of conventional sewerage system). In order to have total sanitation solution for waste water in such areas following approach may be adopted:

Approach 1: Handling of black and grey water separately, black water from toilet shall be treated through on site sanitation system. Then, digested sludge shall be treated at FSTP. It involves transportation of digested sludge to FSTP and timely desludging. Grey water from kitchen and bathroom shall be collected through small bore pipes and shall be treated at waste water treatment plant designed for sullage.

Approach 2: Black and grey water to be collected through small bore shallow sewers and micro zones to be formed. Each micro zone shall have a waste water treatment plant. The treated waste water and dewatered sludge shall be put to reuse to bring sustainability.

5.4 On Wastewater as a Resource

5.4 (A) Reuse of Treated Used Water

Treated wastewater effluent is considered as a water resource and is added to the water stock for reuse. In general, public health concern is the major issue in any type of reuse of wastewater, be it for irrigation or non-irrigation utilization, especially long term impact of reuse practices. It is difficult to delineate acceptable health risks and is a matter that is still hotly debated. Potential reuse of wastewater depends on the hydraulic and biochemical characteristics of wastewater, which determine the methods and degree of treatment required. While agricultural irrigation reuses, in general, require lower quality levels of treatment, domestic reuse options (direct or indirect potable and non-potable) reuses need the highest treatment level. Level of treatment for other reuse options lie between these two extremes. Following reuse options for treated used water in reference to the circular economy in waste water management has been identified

In Agricultural Sector:

1. Agriculture is the major consumer of water in the country with about 85% of the total water demand. Agriculture sector is expected to remain the highest water consuming sector even in the future, despite improved irrigation techniques. Hence, priority shall be given to agricultural reuse of treated effluent for unrestricted irrigation.
2. Blending of treated wastewater with fresh water shall be made to improve quality where possible. Crops to be irrigated by the treated effluent or blend thereof with freshwater resources shall be selected to suit the irrigation water, soil type and chemistry, and the economics of the reuse operations.
3. Crop nutrient requirements shall be determined taking into consideration the prevailing effluent quality. Overuse of nutrients shall be avoided.
4. Accumulation of heavy metals and salinity shall be monitored, managed and mitigated. Leaching of soils shall be advocated by the irrigation authorities.
5. Studies should be conducted and projects designed and implemented to store the excess treated wastewater in surface reservoirs but artificial recharge is not permitted. Due attention shall be given to the quality of treated and groundwater and the characteristics of the strata
6. Treated effluent quality should be monitored and users alerted to any emergency causing deterioration of the quality so that they will not use such water unless corrective measures are taken.

In Industrial Sector

1. Industrial reuse of reclaimed wastewater represents major reuse next only to irrigation in both developed and developing countries. Reclaimed wastewater is ideal for many industrial purposes, where effluent is to be used in the industrial processes, it should be the responsibility of the industry to treat it to the quality standards required.
2. Based on the conclusions of the pilot feasibility study, a full-scale treatment plant employing cross-flow membrane microfiltration system may be installed. The membrane filtration system can remove all suspended solids, fecal coliforms, and giardia cysts. It could also significantly reduce human enteric viruses such as *reovirus* and *enterovirus*. The water reclamation plant at Earing Power Station demonstrates the potential for reuse of wastewater in power generation and other industrial manufacturing facilities.

   Industrial uses for reclaimed water include:

   (i) Evaporative cooling water:-
      (a) Once-through cooling system.
      (b) Re-circulating cooling system.
      (c) Cooling water quality requirements.

   (ii) Boiler –Feed water- The use of reclaimed water differs little from use of conventional public supplies for boiler-feed water, as both require extensive additional treatment quality requirement for boiler feed make up water are dependent upon pressure at which boiler is operated.

   (iii) Industrial process water-

   Suitability of reclaimed water for use in industrial process depends upon particular use like-

(a) Textile industry.
(b) Pulp and paper.
(c) Chemical industry.
(d) Petroleum and coal.
(e) Power Plant
(f) Cement Plants

3. Whenever possible, other end uses of treated effluents; such as recycling, cooling, power generation, etc. shall be considered.

4. Power sector is a major consumer of water. As per Ministry of Power's Tariff Policy 2016, it is mandatory for Thermal Power Plants (TPPs) to use treated sewage water from STPs operated by municipalities or other local authorities located within a 50 km radius.

In Municipal Uses

Treated used water shall be used for municipal purposes mandatorily after developing such infrastructure as may be required for following:

i. In maintenance of parks, public toilets, landscaping, dividers etc.
ii. Fire protection
iii. Municipal purposes like dust mitigation, road washing, construction activity, etc.
iv. With an aim to increase the green-blue spaces in urban centers, treated wastewater in bulk can be consumed in such developments along with urban impoundments and lakes.

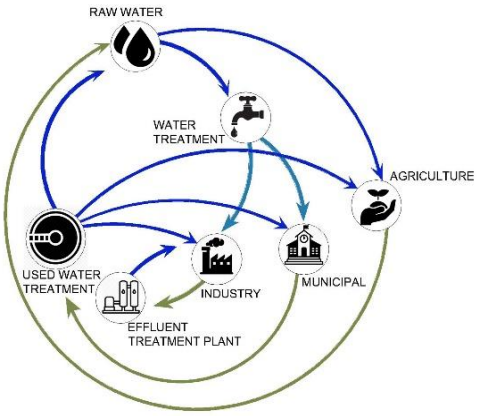


Fig: Circular Economy in Waste Water Management

Other Uses:

i. **In Construction Activities (where use of TWW permitted as per code) –**
- The concerned local body/implementing agency shall provide facility of filling tankers with TWW to construction sites against a fixed, pre-determined charge. Locations for setting up filling stations for TWW in tankers shall be developed as per demand at local level.
- Efforts would be made to impose a condition to use TUW from the nearest STP during the construction phase while granting Environmental clearance and Consent to Establish (CTE).

ii. Forestry
iii. Non-potable Domestic Reuse like in Gardening and toilet flushing etc.
iv. Non-potable uses in Railways, Airports etc.
v. Fish-farming
vi. For large commercial or institutional users, multi storeyed buildings, residential societies, hotels and hospitals with a built-up are >20,000 sqm shall mandatorily set up their own STP and reuse that treated water for dual flushing and other non-potable uses like gardening, flushing, washing etc.

The detailed project report should clearly define the best reuse option particular to town and strategy to obtain it. Action plan with clarity should be the part of Detailed Project Report (DPR), while preparing sewerage projects. Before deciding the reuse of treated waste water, authorities must fulfill the water quality norms and its legal

implications. No DPR should be approved without the circular economy concept with at least the reuse plan of STP treated water, energy recovery and sludge reuse.

- Mapping of STPs with agricultural fields/industries/parks/waterbodies should be done for reuse/recycle of treated waste water. ULBs shall identify suitable sectors for reuse of treated wastewater, based on locally appropriate options that ensure environmental, social and economic sustainability.
- In case of Industrial reuse all concern ULBs shall exercise upon the reuse in nearby Industrial area. The water quality parameter may be dealt by any of following ways:

  (a) ULB may install requisite tertiary plant to meet the industrial water quality parameters and increase charge of water to meet capital and O&M cost. **OR**

  (b) ULB may supply secondary treated water to RIICO area and RIICO may install requisite tertiary plant in the industrial area as per their demand. In this case rate will be as given in this policy.

- Cities should identify 'No-Freshwater Zones' to promote Reuse of treated used water. In these zones, pricing incentives shall be provided to promote TWW especially for agriculture and industries. The criteria for selection of no freshwater zone are mentioned at Annexure-4.

5.4 (B) Sludge produced from On-Site and Off-Site Sanitation

Sludge has for long been viewed as a resource rather than merely as a by-product of liquid waste, since it contains valuable nutrients that promote the growth of crops. Hence, the need of the hour is to develop sustainable sludge management and reuse strategies that are both economically, socially and technically sound and environmentally feasible integrating circular economy principles.

Scientific treatment of sludge is expected to result in saving of CO_2 emission. There are many proven technologies to treat sludge vis-à-vis composting, hygienisation, thickening, dewatering, incineration, gasification, pyrolysis etc. given in the Manual of Sewerage & Sewage Treatment Systems, 2013 published by Ministry. Since this publication there are many globally sustainable technologies available around the world.

Sewage Treatment Plants may be designed for bio-gas production from sludge after assessment of sludge production. Plans and studies for power generation/CNG from sludge, if proven technically, economically and financially feasible, shall be made with due attention to environment impacts.

Following mitigation measures regarding sludge management shall be adopted at local level:

1. Compost Testing facilities and Labs should be developed at city level.
2. ULB shall have to retrofit STPs with Sludge Recycling facilities adopting principle of circular economy.
3. ULBs need to notify fee/tax on dumping of sludge in landfill for plant operators/desludging operators

Reuse options for sludge

Sludge produced from the treatment process would be processed so it may be used as fertilizer and soil conditioner in agriculture. Care shall be taken to confirm to the regulations of public health and environment protection norms.

Environmental benefits from Reuse of Treated water and sludge

1. Reuse of treated wastewater for irrigation, industrial or other uses instead of using fresh water extracted from ground water significantly **decrease the strain on ground water**.
2. **Reduced energy consumption** associated with production, treatment and distribution of freshwater.
3. **Improvement in the financial sustainability** of Urban Local Bodies through improved recovery of the costs of wastewater treatment and supply
4. **Reduction in chemical fertilizer usage** will also help to reduce GHG emission

5.5 On Pricing, Financing and Investment

1. In view of increasing marginal cost of wastewater collection and treatment, wastewater charges, connection fees, sewerage taxes and treatment fees shall be set to cover at least the operation and maintenance costs. It is also highly desirable that part of the capital cost of the services shall be recovered. The ultimate aim is for a full cost recovery.
2. Appropriate criteria in order to apply the "polluter pays" principle shall be established.
3. Different charges for different areas may be applied. This shall be assessed for each geographical area as a function of end users and effluent quality and will be subjected to economic and social considerations.
4. Because of the limited financial resources available to Government of Rajasthan, setting investment priorities in wastewater will be compatible with government investment plans.
5. Criteria for prioritizing investments in the wastewater sector shall take into account the current and future needs of the state, needs to expand wastewater systems in urban areas and to provide wastewater systems to smaller towns and villages.
6. Priorities of wastewater projects shall not be disconnected from water supply projects and urbanization in general. Decisions will be made concerning them to attain optimum solutions to the need for services, availability of finance and availability of trained manpower.
7. Treated effluent/all the resources shall be priced and sold to end users at a price covering at least the operation and maintenance costs of delivery.
8. As per urban reforms (under various schemes by MoHUA) 100% cost of O&M of sewerage system shall be recovered from consumers. The costs will depend on the system/technology adopted for collection of sewerage and treatment and the administration costs. It is important that the full cost of the service is assessed for each urban area instead of adopting a typical cost assessment. The full cost shall cover the following:
    (i) Institutional aspect of the sanitation service e.g. the management information systems, accountancy and finance management, billing and collection, customer services, etc. and oversight activities.
    (ii) Operating, maintaining (on a planned maintenance basis), repairing replacing, and extending sanitation service physical infrastructure.
    (iii) Keeping updated infrastructure and customer data on a GIS base.
    (iv) Managers, staff, vehicles, equipment and consumables associated with

the above.

(v) Consumable like chemicals etc.
(vi) Power charges.
(vii) Spare Parts.
(viii) Any other O&M contract amount

5.6 Source of Funds for Sewerage Project

1. In general, implementation of wastewater management project requires substantial capital expenses. In addition to capital cost associated in construction of wastewater collection network and treatment facilities, there are also operation, maintenance, and replacement and administrative costs. Hence responsible agencies may consider following sources of Funds for Construction of Sewerage Project:
   (i) Own Source of funds of ULB.
   (ii) Funds Provided by GoI under centrally sponsored schemes.
   (iii) Loan taken by State Government from multinational international organizations.
   (iv) Loan from NCRPB/HUDCO/other financial institutes.
   (v) Grant from Central/State Government.
   (vi) Funds deployed by PPP operators.
2. The urban local bodies are proposed to have following sources for funds for O&M:
   (i) User charges: -At present, there shall be no increase in sewerage taxes and these shall remain same as today i.e. 33% of Water bill.
   (ii) Sale of Carbon Emission Reduction (CER) Certificate.
   (iii) Sewerage Connection fees.
   (iv) Revenue from sale of treated waste water.
   (v) Revenue from sale of fertilizer.
   (vi) Revenue from sale of bio-gas.
   (vii) Revenue from sale of electricity generated.

The government shall include the provision of the recovery of full capital cost of laying of sewerage system and prorate cost of STP for new colonies in town policy. As per AMRUT-2.0 reform agenda, a 'new tap of water' through recycle of treated used water is to be created to meet at least 20% of total city water demand and 40% for industrial water demand at State level. It shall be mandatory for the ULBs to adhere to above requirement of reuse and recycling of treated waste water.

The base tariff for treated waste water shall be 50% of drinking water supply tariff in case of industrial/commercial reuse and Rs. 3.00 per thousand liters increasing at the rate of 10% per annum in case of agriculture/horticulture/fishery/landscape reuse. Untreated Waste Water may be sold to buyer for appropriate treatment by installing Sewage Treatment Plant by him as per Central Pollution Control Board (CPCB) requirement to reuse treated waste water, at the rate 50% of treated waste water tariff mentioned as above. Urban Local Bodies can issue letter of intent (LoI) accordingly. No untreated waste water without appropriate treatment shall be disposed/Reuse/utilized for any purpose.

Base tariff for sale of Biochar/manure/CNG shall be decided by city level committee.

At initial stage to promote reuse of Treated Used Water in the state and to incentivize industries, a City Level Committee under the chairmanship of District Collector is constituted as under to relax the base TWW tariff up to the limit that cost of TWW reuse project and operating cost may be recovered:

1. **District Collector-Chairman**
2. **Treasury Officer- Member**
3. **General Manager-DIC- Member**
4. **Regional Manager - RIICO - Member**
5. **Regional officer- RSPCB- Member**
6. **Representative of DA/UITs- Member**
7. **Municipal Commissioner/Executive officer – Member Secretary**

The Committee will also approve the project proposal for the supply of TWW, level of treatment (secondary or tertiary), reuse of all other end products and the executive agency for the project.

5.6 (A). Sewerage Project Through Public Private Partnership (PPP)

1. Requirement of funds to meet the establishment of infrastructure for reuse of sewage after necessary treatment cannot solely be met by budgetary resource from Government and urban local bodies. To attract private investment, to leverage its efficiency, to provide quality treatment facility and services at an optimal cost, an enabling policy and institutional mechanism would be developed.

2. Viability Gap Funding: - The guidelines for financial support to PPPs as issued by the Department of Economic Affairs shall be followed for applying VGF. As per the prevailing guidelines, GoI provide viability gap fund subject to maximum of 30% of the project cost. State would also provide additional viability gap funding up to 30% of the project cost. Total viability gap funding will not exceed 60% of project cost.

3. PPP/Revenue Sharing operator may propose to build a waste-water recycling and reuse plan along with associated sewerage network on HAM, Design-Build-Finance-Operate-Transfer (DBFOT) basis or any other methodology of PPP/ Revenue Sharing option. The PPP partnership can be sought through Swiss Challenge Method of Procurement as per approved guidelines of GoR. The concession period may be high up to 30 yrs. The Rajasthan Transparency in Public Procurement (RTPP) Act should be followed.

4. Adequate time for data collection, stakeholder consultation and project preparation for PPP projects is necessary and PPP model like DBOT, DBFOT, HAM etc. shall be chosen by considering Value for Money factor & best use of resources.

5. Identification, evaluation, allocation & management of risks is heart of effective PPP design, so it should be done properly.

6. The business models developed by the implementing agency shall be finalised after adequate due diligence and detailed assessment.

7. *The Swiss challenge system involves an unsolicited proposal for a*

government project, which allows third parties to challenge the original proposal through open bidding and then lets the original proponent counter-match the most advantageous / most competitive offer. Under the Swiss Challenge Method, the project proponent that had first submitted the proposal for the development of the project, based on which the project was conceived and developed, is given the first right of refusal to match the most advantageous/most competitive bid received in the competitive bid process for the said project.

8. Revenue sources for PPP/ Revenue Sharing operator: -
   (i) Sale of reclaimed water.
   (ii) Sale of CER.
   (iii) Sale of Electricity/Biogas/REC (Renewable Energy Certificate).
   (iv) Sale of Fertilizer.
9. Criterion for Selection of PPP/ Revenue Sharing operators: One or combination of following criteria may be adopted for PPP operator selection through competitive bidding, The Rajasthan Transparency in Public Procurement (RTPP) Act should be followed:
   (i) Lowest bid in terms of user fee from consumers.
   (ii) Royalty paid to ULB per KL of treated waste water.
   (iii) Highest upfront fees.
   (iv) Lowest present value of subsidy.
   (v) Lowest capital cost and O&M cost for projects.
   (vi) Highest equity premium.
   (vii) Quantum of state's support solicited in present value.
10. Incentives and Concessions proposed to PPP/Revenue sharing operator for setting up of STP for Reuse/Recycling of treated waste water:
   (i) Land to PPP operator will be given on lease as per rules.
   (ii) Other incentives and concessions as per GoI/GoR policies.

5.6 (B). Sewerage Project through Hybrid Annuity based PPP Model - Model A

The existing as well as new projects of Sewage Treatment Plants can be taken on Hybrid Annuity Based PPP Model (HAM). The HAM is a mix of engineering, procurement and construction (EPC) and build-operate-transfer (BOT) annuity formats, with the government and the private companies sharing the total project cost in the ratio of 40:60 respectively. This model will reduce financial burden on the concessionaire during project implementation phase. The model will include the following:

1. Concession period as well as payment period shall be 15 years.
2. 40% of total payment shall be made after completion of the Sewage Treatment Plant. The remaining 60%, which shall include operation and maintenance costs and the assured profits, shall come in the form of fixed annuities.
3. The concessionaire shall be selected through competitive process based on Rajasthan Transparency in Public Procurement (RTPP) Act.
4. PPP operator shall be eligible for incentives and concessions as mentioned in 5.6. (A).10.

Please refer Annexure 2 - 3(a) for example.

5.6 (C). Sewerage Project through Hybrid Annuity based PPP Model - Model B

The existing as well as new projects of Sewage Treatment Plants can also be taken on regular Hybrid Annuity Based PPP Model (HAM) like in "Namami Gange". The HAM is a mix of engineering, procurement and construction (EPC) and build-operate-transfer (BOT) annuity formats, where 40% of the project cost will be released after the commissioning of STP and remaining 60% will be released in equal annuities for the O&M period of 15 years. This model will reduce financial burden on the concessionaire during project implementation phase. The model will include the following:

1. Concession period as well as payment period shall be 15 years.
2. 40% of total payment shall be made after completion of the Sewage Treatment Plant.
3. The remaining 60%, which shall include operation and maintenance costs and the assured profits, shall come in the form of fixed annuities.
4. The concessionaire shall be selected through competitive process based on Rajasthan Transparency in Public Procurement (RTPP) Act.
5. PPP operator shall be eligible for incentives and concessions as mentioned in 5.6. (A).10

For Example:

Total Project Cost	Rs. 100 Crores
Concession Period	15 years
Share Of ULB	Rs. 100 Crores
Fund released to Contractor	
Construction linked payment (After Commissioning of STP)	40% of the Project Cost i.e. Rs. 40 Cr.
Annuities	Fifteen equal annuities of 60% of the project cost (=60/15) i.e. Rs 4 Cr. per annum
Revenue stream	Usage of 100% treated water with ULB

5.7 On Standards, Regulations and Quality Assurance

1. Particular attention shall be focused on adopting and enforcing effluent and sludge standards for municipal and industrial wastewater treatment plants and for discharges from industries, laboratories, hospitals, slaughterhouses and other businesses.
2. Extensive and comprehensive monitoring programs shall be developed. Influent to and effluent from the plants and throughout watercourses shall be measured and monitored against all appropriate parameters to ensure that public health objectives and treatment efficiency goals are attained.
3. All crops irrigated with treated or mixed waters shall be analyzed and monitored periodically.
4. Observation wells shall be installed near the treatment plants to monitor groundwater quality where necessary, and to mitigate adverse impacts where

and when needed.

5. Data collected from the monitoring process shall be entered and stored, processed and analyzed through computer software, and results published periodically.

6. Roof and storm water connections to public sewers shall be prohibited. Collection of storm water shall be done separately and will be the subject of water harvesting.

7. Effluent and sludge standards for the disposal of hazardous liquid wastes shall be defined to ensure the safe disposal of such wastes.

8. RSPCB/ CPCB regulations for disposal norms shall be mandatory.

9. Industrial waste water is not allowed to disposed off in the sewer line. ULB can issue notification for penalties to be imposed on the such industrial units.

10. Laboratories shall be maintained and properly equipped to provide services and reliable data needed ensure enforcement of and adherence to standards and regulations.

5.8 Management Information System

A well-developed data management and information system is a prime requisite for better management. Therefore, it is important to have data of waste water generation, treatment of waste water, recycle of waste water, method of waste water treatment plants, revenue from waste water recycling, expenditure etc., For management of all these details a state level data centre at Jaipur will be established. All municipal corporations should also have city level data centre. Data so generated shall also be placed in public domain to ensure better transparency, utility and accountability.

5.9 On Legislation and Institutional Arrangements

1. Legislation and institutional arrangements for the development and management of wastewater shall be periodically reviewed. Gaps shall be filled, and updating of the institutional arrangements with parallel legislation shall be made periodically to cope with varying circumstances and for this government shall notify an agency giving full power to take necessary action in this matter.

2. The role of the Government shall be fine-tuned and its involvement reduced to be regulatory and supervisory. Involvement of the stakeholders in wastewater management and support shall be introduced and expanded.

3. **State Level Committee**:

In pursuance to State Sewerage & Waste Water Policy-2016 State Level Committee has been constituted vide office order dated 22.02.2017 for effective implementation and to resolve any issue/ difficulty in implementation of above policy. The quorum of this committee shall not be less than 05 members.

The ToR of the Committee is as follows: -

1. Overall Review of Sewerage status & Progress Monitoring.
2. Prepare Guidelines, directions and clarifications.
3. Inter-department Co-ordination.
4. Any other issue.

The amended committee is constituted as follows:

1	ACS/Principal Secretary/ Secretary, LSG, GoR	Chairman
2	ACS/Principal Secretary/ Secretary, PHED, GoR	Member
3	Managing Director, RIICO or his representative not below the rank of joint secretary or equivalent	Member
4	ACS/Principal Secretary /Secretary, Agriculture or his representative not below the rank of joint secretary or equivalent	Member
5	ACS/Principal Secretary /Secretary, WRD or his representative not below the rank of joint secretary or equivalent	Member
6	Member Secretary, Rajasthan State pollution Control Board or his representative not below the rank of joint secretary or equivalent	Member
7.	Joint Secretary (Finance), GoR	Member
8.	Director, Local bodies	Member
9.	Executive Director, RUDSICO, jaipur	Member Secretary

5.10 On Public Awareness

1. The public shall be educated through various means about the risks associated with the exposure to untreated wastewater and the value of treated effluents for the different end uses.

2. Programs for public and farmer's awareness shall be designed and conducted to promote the reuse of treated wastewater, methods of irrigation and handling of product. Such programs shall concentrate on methods of protection of farmers health, animal and bird health and the environment.

3. Public awareness campaigns shall also be waged to educate the public on the importance of domestic hygiene, wastewater collection, treatment and disposal.

4. It is observed that the system is dependent on the appreciation of the beneficiaries to the advantages and importance of the system to them and thereby working together towards making it successful. The co-operation is vital for following areas:

   i. Protecting the system from getting choked due to entry of extraneous material in the sewer system. A vigilant public will help prevent this.

   ii. The sewerage system yields full benefits or disease protection when there is 100% connectivity.

   iii. It is important that the beneficiaries appreciate the benefits and pay for their upkeep. The systems require proper upkeep and the cost associated with maintenance and upkeep should at least be recovered from the beneficiaries. The principle of the polluter pays will be adopted only by an enlightened and participating public.

5. A conscious campaign has to precede the planning and implementation of the sewerage systems. ULB, Non-Government Organizations and local neighbourhood committees could give the process a thrust.

6. A public participation process will not only aid in identifying potential

consumers but also serve as a public education program. Potential users will be mainly concerned with the quality of reclaimed water, reliability of its delivery and the constraints in using reclaimed water. Also, connection costs or additional sewerage treatment cost might affect their ability to use the product. Consultations with various stake holders will aid in structuring of tariff and discounts for adopting reuse technologies, awareness on dual piping system, water conservation and safety issues.

7. In chapter XII of Rajasthan Municipality Act 2009, there are mandatory provisions of taking sewer connections and penalty provisions against defaulters under section 202, 203, 204, 208, 214, 222 and 259. Municipal authorities must use these provisions and ensure 100% sewer connections.

8. Municipal Bodies should decide and pass resolution regarding sewer connection charges. The provision should be widely publicized.

9. Series of 'Sewer connection camps' may be organized. The time and venue should be publicized widely to inform residents. The days, time and venue should suit the convenience of public.

10. Ensure that all Government offices and schools are connected.

11. Farmers shall be encouraged to determine the rate of water application needed for different crops, taking into consideration the value of nutrients in the treated water and other parameters.

12. Farmers shall be encouraged to use modern and efficient irrigation technologies. Protection of on-farm workers and of crops against pollution with wastewater shall be ensured.

13. Awareness campaign for using water efficient fixtures to reduce the volume of wastewater being produced.

14. Awareness campaigns to involve the students from schools and universities and educate them about Sewerage system, which in turn will act as main driving force for behavioral change in public.

5.11 On the Human Resources Development & On Research and Development:

1. Capabilities of human resources in the management of wastewater shall be enhanced through training and continuous education. Work environment shall be improved and incentives provided.

2. Establishment of State Water & Waste water Training Center at state level. It will help in training of human resources in this sector.

3. Human resources performance will be continually appraised in order to upgrade capabilities, sustain excellence, provide job security and incentives to qualified individuals with excellent performance.

4. Applied research on relevant wastewater management topics shall be adopted and promoted. Topics such as the transfer of wastewater treatment technologies, low cost wastewater treatment technologies, reduction of energy consumption and others will receive adequate support.

5. Cooperation with specialized centers in the country and abroad shall be encouraged, and raising of funds for this purpose shall be supported.

6. Transfer of appropriate technology suited for local conditions will be a primary target for the development activities and for adaptive research.

Innovation and Research and Development:

Local Self Department shall take up innovation and R&D activities on regular basis. There shall be an innovation cell at Directorate of Local Bodies, RUDSICO, RUIDP and Municipal Corporation. The Research and Development activities shall be taken up utilizing available resources and engaging required experts through consultancy. It is advised that there should be a dedicated fund for R&D activities, which may be 0.5% of total value of development works carried out by that agency. RUIDP has already constituted an innovation cell to carry out R&D activities and the innovations and inventions in RUIDP being done under "RUIDP Technology". Trade Mark has been obtained for "RUIDP Technology" and has been published in Trade Marks Journal No: 2090 dated 06.02.2023. Patent granted on 08.08.2022 for "RUIDP-WWTP".

The use of technology, robotics and artificial intelligence shall be adopted for improving the operation and performance monitoring mechanism of STPs. Additionally, smart technological solutions for the removal of sewer blockages may be explored.

5.12 On Selected Priority Issues

1. To the extent that design capacities of wastewater treatment plants permit, priority of collection and house connections shall be accorded to expansion of urban areas served by treatment facilities. Users willing to contribute to the cost of the services in addition to fees and charges set by laws and regulations shall also be given priority.
2. Where design capacities of treatment facilities and of conveyance systems are approached or exceeded, priority shall be given to the expansion of such capacities.
3. Priority shall be accorded to situations and locations where waste-water disposal practices threaten the environmental integrity of freshwater resources, and where performance of cesspools and percolation pits pollute underground water aquifers.
4. ULBs shall upgrade STPs based on conventional technology to comply with the stringent standards.

5.13 On Service Level Benchmarks & Implementation Plan

1. It is intended to achieve the following bench marks in the cities as per priority as above:

S. No.	Proposed Indicator	Benchmark
1	Coverage of toilets	100%
2	Coverage of sewage network services	100%
3	Collection efficiency of sewage network	100%
4	Adequacy of sewage treatment capacity	100%
5	Quality of sewage treatment	100%

S. No.	Proposed Indicator	Benchmark
6	Extent of reuse and recycling of sewage	100%
7	Efficiency of redressal of customer complaints	100%
8	Extent of cost recovery in sewage treatment	100%
9	Efficiency in collection of sewage charges	90%

2. **Action Plan**: It is envisaged to achieve service level benchmarks described above as per time frames mentioned below, subject to availability of funds:

City	Time Frame Starting Year 2025-26
District Head Quarter	5 years
National Capital Region, NCR Towns	
Heritage town	
Cities having coverage less 100%.	
Water Supply level more than 135 lpcd	
Cities with population above above 1 lac	
Cities with population less than 1 lac	7 years
Reuse	
100% Reuse at existing STP	5 years
New STP	Before establishment (DPR Stage)
Property Connection	
(i) Where system is already commissioned 100%connection.	Within six months.
(ii) New Networks 100% connections	Within 90 days of commissioning

Budget announcement FY 2025-26 has announced Deen Dayal Upadhyay Sahari Vikas Yojna (DDUSVY), which addresses gaps in waste water management and enhances quality and service delivery in waste water management sector. The financial outlay of DDUSVY is Rs. 12,050 Cr with an implementation period of 7 years.

3. The sewerage projects shall be executed by Urban Local Body or any agency authorized by them. RUDSICO (Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Ltd)/its successor company will act as SLNA (State Level Nodal Agency).

4. For the smooth implementation of State Sewerage and Waste water Policy and to resolve any issues arising in its implementation, a Committee shall be constituted at Department Level.

5. Development of Integrated urban water resource management plans:
Each ULB shall develop an Integrated Urban Water Resources Management Plan through a consultative process by:

i. Identifying demand for untreated and secondary treated wastewater by

agricultural, industrial and other users, including:

- Largest potential users of STW, in order to maximize possible revenue streams from the sale of STW

ii. Ensuring supply of a sufficient volume of secondary treated wastewater for distribution

iii. Identifying local water resources availability and requirement for environmental flows, along the hydrological principle of return flows.

The ULBs will explore Public Private Partnerships (PPPs) as a possible option for implementation of wastewater reuse projects, focusing on bringing in private sector expertise for sustainable operations and maintenance of wastewater assets, with balanced risk allocation and performance-based remuneration.

6. Integrated Urban Waste Management Approach:

i. To ensure the sustainable operation and longevity of the sewerage infrastructure, it shall be strictly prohibited to dispose of solid waste (including domestic garbage, plastic, construction debris, and any non-biodegradable materials) into the sewerage network.

ii. ULBs shall identify illegal dumping & choke points and install trash traps, grating or bar screens at key sewer inlets and manholes to prevent solid waste entry.

iii. ULBs shall adopt routine cleaning and maintenance of vulnerable sewer segments prone to clogging. Retrofitting of drains and sewer openings shall be done with protective grating to reduce clogging incidents.

iv. Awareness campaigns shall be undertaken by ULBs to educate citizens on the harmful effects of disposing solid waste into sewer systems and promote responsible waste segregation at source.

v. Provision of proper waste collection systems and regular monitoring shall be ensured at the household, community and institutional levels. The design of manholes and chambers shall be optimized to discourage solid waste entry, and integration with solid waste management policies shall be ensured.

vi. ULBs shall identify the projects to promote the development of facilities for co-treatment of biodegradable solid waste with sewage sludge at sewage treatment plants (STPs) to enhance biogas production and reduce landfill dependency.

vii. ULBs shall promote the use of treated wastewater for landscaping, agriculture, and industrial purposes, and integrate the use of compost derived from solid waste as soil conditioner for treated wastewater irrigation zones.

viii. It shall be mandatory for all STPs to be equipped with adequate preliminary treatment infrastructure, including mechanical screening and grit removal systems to ensure effective removal of solid waste mixed with influent sewage. The solid waste so collected shall be disposed of in compliance with the Solid Waste Management Rules, 2016.

ix. Efforts would be made to develop a surveillance mechanism to monitor tankers disposing industrial wastewater and slurry into manholes or sewer lines. Punitive action shall be taken against the defaulters.

ANNEXURE 1: Vital Information& Suggestions on Sewerage System

1. The physical Infrastructure required to be planned can be broadly classified as:

(i) **A Sewerage System:** Including the onsite disposals system, network of pipes that collect sewage from domestic, institutional, commercial and industrial premises, the collector and interceptor sewers and pumping stations that convey the sewage to treatment plant. Storm water and industrial waste water shall not be allowed in the Sewerage system. Heavy penalty is to be imposed on the industries discharging industrial waste water in the sewerage system. Industries should make separate arrangement for treatment of Industrial waste water.

(ii) **Treatment Plant:** Where the quality of the sewerage is improved for its safe disposal or reuse. The sludge generated by the sewage treatment process is also normally processed at the plant for safe disposal and reuse. Treatment plants must have disinfection unit. The treated waste water shall not be allowed to discharge/ reuse without disinfection to eliminate the pathogens present in the treated waste water. In each STP (proposed and existing) about 100 m- 200 m distance shall be declared as exclusion zone and in this zone dense plantation is to be done and priority is to be given to indigenous plants.

(iii) **Effluent Disposal Facilities:** For conveying the treated liquid effluents to the point at which they are either safely disposed of into the ground or to a body of water – a water course or lake or to a point where they are directly reused in agriculture, fish farming, forestry, industry or planned reuse site. The disposal in the water body shall be taken up only when other options are not feasible /appropriate.

(iv) **Sludge Disposal:** By means of which liquid, semi-solid or dried sludge are transported to the point where they are either safely disposed to sanitary landfill or recycled, principally for use in agriculture. It shall be ensured that there shall be no crude dumping of STP sludge as it may create unhygienic and un-aesthetic conditions. Adequate processing of sludge must be carried out before disposal.

2. The proposed systems should satisfy the following:

(i) Satisfy its purpose based upon appropriate technology.
(ii) Will respond to environment and social concerns.
(iii) Will generate a satisfactory rate of return.
(iv) Be both sustainable and affordable.

3. The sewerage system is designed for a sufficient design period (generally 30 years) consisting of one or more outfall sewers, trunk sewers and laterals generally operating by gravity, but with force mains and pumping stations where required. The systems are to be designed on separate system to accept the domestic waste including sludge but excluding any rain water and industrial waste as acceptable. The house collection system should be designed to achieve this. Households sludge connectivity should be ensured for smooth functioning of the STP. Awareness program should be planned for households sewer connection.

4. Both the alternatives (i) centralized system and (ii) decentralized system should be

evaluated before deciding type of system. Where funds are restricted or for smaller towns based on possible re-use of treated waste- water, decentralized approach may be adopted.

Decentralized System shall be considered where-

1. Existing on-site systems to be improved
2. For isolated communities
3. Localized reuse opportunity is available
4. Financing of expansion of existing network/STP is not available
5. Residential density is sparse
6. Domestic supply of water is short

Comparison between Centralized and Decentralized System

Criteria	Centralized System	Decentralized System
Capital Cost	Huge	Small
Development in	Big area	Micro zones
Sewer Size	Big	Small
Prediction of Sewage Volume	Hardly	Easier
Reuse Possibilities	Less	More
Depths of excavation	More	Less
Discharge in water body	High impact with large amount at single place	Less impact due to small amount
In case of non-functioning	Major impact to environment	Less impact

5. The system is beneficial when all the premises are connected to the system and there is no waste water flowing in the drains. The service lines to connect the house connections to the sewer system should be laid along with the laying of the sewers up to the boundary of the premise and plugged so that it can be extended by the premise owner within his premise.

6. The surface drains should not be connected to the sewer systems as they also carry rain water, solid waste and silt which tend to choke the sewers.

7. The program of construction of the sewerage systems especially in the existing inhabited colonies should be made very carefully. Any systems that are laid but not commissioned are prone to be filled up by dirt and solid waste. This is likely to make the commissioning very difficult at a later date.

8. It is desirable to start from the downstream end of the out fall and commission it. The trunk mains should be taken up after this and commissioned as the work progresses. The laterals that get connected to the commissioned sections of outfall/trunk sewers only should be laid.

9. The construction program for the STP and sewer network should be planned and executed in such a fashion so that both of these get commissioned at the same time.

10. It is generally not possible to take up work for the whole city at once and the work may have to be prioritized. A method of prioritizing can be:

(i) Population of area.

(ii) Areas where lack of sewer system is creating unhygienic living conditions or unacceptable odor levels, e.g. areas with a high population density and no drainage system or found with low permeability adversely affecting septic tank soak ways.

(iii) Areas with high groundwater level requiring the use of cess-pools and where frequent emptying of the tanks is either impractical or extremely costly.

(iv) Area where the quality of the ground water is adversely affected by septic tank effluent and ground water is a source of drinking water or discharges in a polluted state to a water course.

(v) City Centre, Commercial Centre etc.

11. In general pumping stations should be avoided on the sewerage systems to the extent possible because of the additional costs involved in construction and operation. They have to be installed if the design so requires. A properly designed and constructed pumping system can give trouble free service. The pumping stations can be suitably automated for better operation.

12. During construction, full care needs to be taken for diverting traffic and for fencing and safety of the excavation sites. The provisions for properly supporting the trenches should be taken. Special care should be taken for ensuring proper backfill and immediate repair of the roads after the work is completed.

13. The most common form of installing sewer is open excavation of trenches or open cut. This method has limitations on account of depth that can be handled, time taken and the disruption of the services of the concerned street for the work period. Usually, this method is not feasible at higher depths. Alternative techniques of trenchless technologies involving tunneling and micro tunneling are used for laying sewers where open cut is not feasible on any of the above counts. This procedure though prevalent in developed countries, is not common in India, but should be considered as an alternative where the situations warrant. The techniques of thrusting pipes in ground can also be used in specific cases.

To ease the execution and to avoid public inconvenience during execution and safety aspects for laying deeper sewers, it is proposed to lay sewer lines with trenchless method. The technology has been preferred on the roads having dense traffic with narrow widths having sewer.

In general sewer network at depth more than 3.5 m, will be laid through trenchless technology. Even if the depth of sewer is more than 3.5 m but if road is wide enough/open area & site condition is favourable, sewer may be laid with open excavation to reduce trenchless laying.

The trenchless sewer has also been proposed at important circles in the city where traffic density is more, in the streets where traffic diversion is not feasible, highway crossing, railway crossing etc.

The complete work of Road Crossing on National Highway and railway crossing shall be done by trenchless technology.

14. Laying sewer and water pipelines & road restoration

(i) In case water supply line or sewer line is to be carried out in the same street, the work of water supply line or sewer line should be done first and the road work be done after they are completed to avoid damage to the road once constructed.

(ii) If both the work of sewerage and water supply pipelines is to be carried out in a street, it should be ensured that both the works are carried out at the same time to ensure that the road is not disturbed two times.

(iii) The issue of relative placement of the water line and sewer line in relation to possibilities of pollution should also be paid attention. For that horizontal and verticalseparation should be followed with the provision in Manual.

(iv) Where the laying is being completed under a road, backfilling and compaction should be done as per specifications. If excavated area has a road pavement, it should be finished at top with a road pavement of the same standard and specifications as the existing pavement. It is desirable to use mechanical compaction devices for ensuring proper compaction and to avoid sinking of the repaired pavement.

15. Sewer network has not been utilized/remain under-utilized in the cities where sewerage facility is available. A large number of households are not connected to sewerage network resulting in prevalence of problems of sanitation, health and hygiene. Hence steps has to be taken at local level for utilization of network.

16. For more effective and quicker utilization of sewerage network created/under creation, greater participation of residents of the city is required. Following steps may be taken to connect every house hold with sewerage network:

(i) Information, Education and communication (IEC) activities to be carried out to interact with citizens to convince them to take sewer connection. IEC activities may be taken up using newspapers, cinema slides, Nukkad Natak, Radio, SMS, Facebook, Twitter, Audio-Video clips, Films on local cable network etc.

(ii) NGOs working in this field and volunteers may be engaged to motivate people to take sewer connections. Children and Schools may provide excellent motivation tool. Competition at school/community level may be held to provide enthusiasm to carry out this activity.

(iii) The plumbers of the city may be enlisted. Workshop of Plumbers must be carried out to train them to carry out sewer connections, without doing any damage to sewer network and connecting waste water of Bathroom, Kitchen and Toilet in proper fashion to avoid any problem of choking.

(iv) A tentative estimate for joining the system of house to sewer line after categorization of houses in different categories such as A, B, C…. based on requirements should be prepared by Municipal Body and must be provided to residents so that there may not be overcharging incidences by the plumbers.

(v) In order to have proper functioning of sewerage, residents should be educated so that solid waste must not find access to sewerage system. The kitchen and bathroom should be provided with mesh.

17. Septage Collection and Treatment

Septage generation rates vary widely from place to place depending on septic tank use practices, number of users, water used for flushing, efficient functioning of tank and contamination control. It can be considered that the volume of sludge evacuated from a septic tank corresponds more or less to the volume of the septic tank, plus some cleansing and rinsing water. Septage is highly concentrated and therefore needs more care in handling and management.

For proper management of septage collected from septic tanks to eliminate the problem of open discharge of septage into the environment shall be

(1) Treatment at faecal sludge treatment plants (FSTPs) or

(2) Co-treated at existing STPs in the vicinity.

18. Operation & Maintenance

(a) Operation and maintenance should be carried out in accordance with the provisions of CPHEEO manual for O&M as amended time to time. It is important to plan for the proper operation and maintenance of the assets created for sewerage disposal. Operation and maintenance should be carried out in accordance with the provision of CPHEEO manual for O&M period of minimum 10 years. Dedicated fund should be provided/planned for proper operation and maintenance of sewerage system and STP.

(b) The important inputs for proper upkeep of the systems are a proper institutional arrangement for overseeing the work, appropriate technical back up, adequate funds, and active cooperation of an enlightened beneficiary public. A monitoring committee/vigilance committee should be constituted to monitor the waste water and storm surface water. A toll-free number for helpline proposes should be created for public grievances.

(c) Most often, there will be lack of technical know-how and experience for operating the systems which are fairly sensitive and require professional attention. The O&M component of the contract can be for 10 years. The responsibilities should be clearly defined in the contract.

(d) Procurement of suitable equipment for ensuring proper maintenance like jetting machines, vacuum tankers, high power suction machines, sewer rods, bucket cleaning machines Robots etc.

(e) Possibilities may be explored for Operation and maintenance on basis of cluster approach of urban bodies for using the facilities jointly and saving on investment.

(f) Funds for O&M: The cost involved in running the Sewage Treatment Plant, transportation of the raw sewage etc makes the system in loss. Treatment to tertiary level also involve additional cost. Local body should plan to generate funds for O&M.

The tariff for domestic, industrial and irrigation water may be increased so that the reclaimed water becomes competitive or cheaper than the normal water. Local body may provide information on quarterly basis regarding quantum of treated wastewater available including long term availability especially in areas which have been declared notified/over-exploited by Central Ground Water Authority (CGWA), so that interested parties/Departments can make an application for reservation of treated waste water.

(g) To achieve energy neutrality in existing STPs during O&M, key performance indicators is to be identified and accordingly ULB should plan for installation of Solar Power plant, Bio gas to energy plant, refurbishment of machineries etc.

(h) Sensor like ammonia /nitrogen sensors, DO sensors etc. in aeration process tank may be installed to optimize treatment process after detailed analysis.

(i) Gas Detectors shall be used at each Sewage Treatment plant and shall be used at the time of cleaning the sewer line to detect explosive/harmful gases.

19. The Municipal Bodies should take into confidence all the stake holders and frame a suitable micro level policy for the sewerage disposal system within the guidelines stipulated in the State Policy and taking into account the local ground level realities. They should take advice from professionals for understanding the options. Such a Policy can include at municipal level:

(i) Physical Targets for Sanitation Coverage with a view of assigning time schedule and setting priority for covering various parts of the city.

(ii) The standard of the service level that may be targeted and should be achieved by regular efforts.

(iii) Effluent disposal standards can be fixed earmarking sites for sewage treatmentfacilities. Identification of effluent disposal options and sites.

(iv) If more than one municipality can be gainfully combined for the system, identifyingthe options and working for such an agreement.

(v) Identifying and laying down the targeted recycle/reuse option of the effluent and sludge.

(vi) Recognition of the principle of "the polluter pays" i.e. recovery of the financialliabilities being undertaken for the system.

(vii) User to involve in participation for creation of fund for capital work.

20. Proposals for commercial or industrial development may be permitted, subject to:

(i) The overall objectives of the policy not being compromised, and

(ii) The statutory authority being satisfied after considering the advice of consultative authorities that intended wastewater disposal arrangements are acceptable.

21. Design framework for service level improvement

Each ULB shall prepare Service Level Improvement Plans (SLIPs), to cover all households with sewerage (including Septage). These plans shall be prepared for next 30 years with short term, medium term and long term plans.
The detailed project Reports (DPR) for sewerage and Septage management shall be prepared as per best engineering practices, socio-economic consideration and guidelines widely acceptable. However, the units which can be developed in modules (e.g. Sewage Treatment Plants, Pumping Stations, On-sites Treatment Facilities, Septage Management etc.) may be designed for appropriate shorter period as stipulated in CPHEEO manual.

22. References For Design of Sewerage System

The sewerage system and its appurtenances will be designed and implemented as per the guidelines laid out in the "Manual on Sewerage and Sewage Treatment" latest edition published by the Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India following the latest developments in the industry and good engineering practices and National Sanitation Policy by GoI.

The details regarding the various Treatment Plant Process are available in the "Manual on Sewerage and Sewage Treatment (latest edition)" published by CPHEEO under direction of the Ministry of Urban Development, GoI and Guidelines of Principal Secretary, UDH&LSG, GoR.

23. Recommended norms for Reuse of Treated Waste Water for various purposes: -

Quality standards for Treated Waste Water for reuse in various purposes are defined as below. ULBs should reach up to these norms for risk reduction/safe reuse of treated water. The existing norms for recycle and reuse of wastewater for specific uses at Table 7.19 of the Manual on Sewerage and Sewage Treatment

Systems, 2013 has been revised by the Ministry. Amended norms for recycling and reuse of wastewater for specific activities are as below:

Recommended norms of treated sewage quality for specified activities at point of use (Modified)

(Table 7.19 of Manual)

S. No.	Parameter	Toilet Flushing	Fire protection	Vehicle Exterior washing	Recreational use (bathing etc.)	Non-contact impoundments (tanks, lakes etc.)	Landscaping, Horticulture & Agriculture			
							Horticulture, Golf course	Non edible crops	Crops	
									Crops which are eaten	
									Raw	Cooked
1	Turbidity (NTU)	≤2	≤2	≤2	≤2	≤2	AA	AA	AA	AA
2	SS	AA	AA	AA	AA	AA	AA	AA	AA	AA
3	TDS	2100								
4	pH	6.5 to 8.5								
5	Temperature	Ambient								
6	Oil & Grease	10	nil	nil	nil	nil	10	10	nil	nil
7	Total Nitrogen as TN	10	10	10	10	10	AA	AA	AA	AA
8	BOD	≤6	10	≤6	≤6*	10	≤6-10 (≤6 perferred)			
9	COD	AA	AA	AA	AA	AA	AA	AA	AA	AA
10	Total Phosphorous as TP	1	1	1	1	1	AA	AA	AA	AA
11	Minimum Residual Chlorine	1	1	1	≤0.5	0.5	nil	nil	nil	nil
12	Faecal Coliform in 100 ml	Nil	nil	nil	≤50	100	nil	100	nil	≤50
13	Helminthic Eggs/litre	AA	AA	AA	AA	AA	AA	<1	<1	<1
14	Colour (Colour or Haxen units)	Colourless						AA	Colourless	
15	Odour	Aseptic which means not specific and no foul odour								

All values are in mg/I except for Turbidity, Ph, Temperature, Faecal Coliform, Helminthic Eggs, Colour and Odour.

AA - as Arising when other parameters are satisfied.

*CPCB prescribes BOD less than 3 mg/I in water body for recreational purpose. Adequate storage shall be maintained in the water body for dilution to maintain 3 mg/l.

24. Used Water Management in Small and Medium Towns (population less than 1.0 Lakh):

In SBM-U 2.0 Guidelines, it also involves that all used water including fecal sludge, especially in smaller cities (population less than 1.0 lakh) are safely contained, transported, processed and disposed so that no untreated fecal sludge and used water pollutes the ground or water bodies.

Inclusion of used water management component under SBM-U 2.0 will help to achieve following two objectives:

i. All used water is safely collected, treated and reused to feasible extent and no untreated used water is discharged into water bodies or the open environment;

ii. All faecal matter and septage is properly collected, treated and by-products

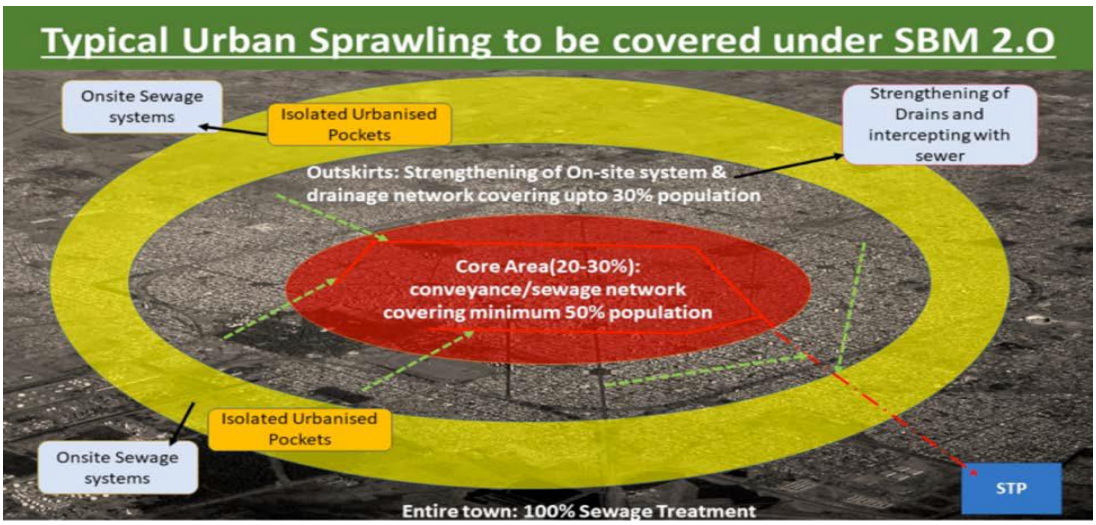
reused.

To achieve the objective of treating used water before discharge into water body/ overland, the following will be the major areas of focus under SBM 2.0:

i. Setting up of Sewage Treatment Plants (STPs)/ STP-cum-FSTP;
ii. Laying Interception and Diversion (I&D) structures including provision of pumping stations and pumping main/gravity main up to STP;
iii. Procuring adequate numbers of septic tank desludging equipments;
iv. Deploying Digital (IT enabled) tools for real time monitoring of efficiency parameters during the operational phase of STPs and allied equipments.

The detailed approach for Used Water Management & FSM is as follows:

Sewer Network in Core Sanitation Zone: ULBs have to identify its "Core Sanitation Zone (CSZ)", defined as a zone which has at least 50% of the town's current population settled over an area comprising about 20-30% of the town's spread (please refer to the diagram given below). The CSZ will be provided with a sewer network to connect it directly to the STP. City can expand network coverage based on necessity and availability of resources over time. For upcoming new green field developments in and around towns, the provision of sewerage network along with decentralized sewage treatment facilities should be factored into planning.



Intercepting Used Water from open drains to Sewer network: State is also required to strengthen existing open drains carrying sullage/sewage and connect the same to the sewer network, wherever feasible, after providing suitable I&D structures like coarse screen, grit chamber, fine screen and settling basin etc. before intercepting into sewer network.

Approach for Fringe Areas: For remaining inhabitants residing in fringe areas outside the CSZ, the town authorities may work out economically judicious solutions, opting between continuing with onsite disposal systems (septic tanks with soak pits) and providing localized community level sewage treatment plants for grey/ black water where feasible or conveying it to STP depending on economics. The septage from these households will continue to be safely hauled to a designated STP under professional arrangements. It is advised that the fringe areas may try to strengthen their onsite disposal arrangements by providing for soak pits where they are missing and forcing the septic tank effluent into the ground, adhering to IS 2470. However, due to practical difficulties in providing sewerage systems to the entire

population, onsite sanitation systems are encouraged in the fringe areas of the towns where it is uneconomical to provide sewers and in areas where it is difficult to provide sewer network. In such cases, STPs along with co-treatment of faecal sludge have been proven to be advantageous and sustainable.

PPP MODELS FOR CONSIDERATION

(A) Re-Use for Irrigation/ Agriculture Choice of Sewage Treatment Technology

Following effluent standards may be adopted:

BOD	≤	10 mg/l
COD	≤	50 mg/l
TSS	≤	10 mg/l
Total Nitrogen	≤	10 mg/l
Total Phosphorus	≤	1 mg/l
Fecal Coliforms	≤	100MPN/100ml

Other parameters to be decided by the local authorities as per site condition with the consultation of experts.

(B) Choice of Irrigation System: Automatic Micro Irrigation (saves water more than 50%,increase in yield by more than 50% and saving in labor by 100%)

Micro-controller based Drip Irrigation system: Drip irrigation is a method that saves water and fertilizer by allowing water to drip slowly to the roots of plants. Automatic micro controller based drip irrigation system ensures that the irrigation take place only when there is requirement of water. The components of micro controller based drip irrigation system include Flow Meter, Control Valve, Chemical Injection Unit, Drip lines with Emitters, Moisture and Temperature Sensors and Microcontroller Unit etc.

(i) Modality to carry out

The stake holders for a successful micro-irrigation by treated waste water are:

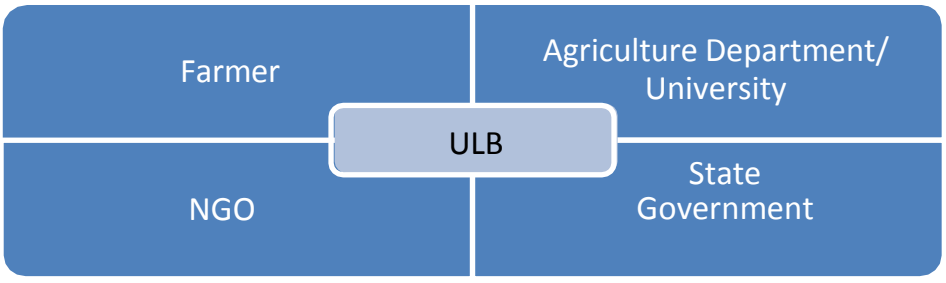
(1) Urban Local Body: owner of treated waste water providing treated waste water to consumerand collecting revenue for it.

(2) Farmers: User of treated waste water and paying.

(3) Agriculture University/Dept.: Knowledge hub for choice of crop, application of fertilizer and other considerations and techniques to achieve high production for the benefit of farmer.

(4) GoI/GoR: providing subsidy for drip irrigation systems in various schemes including NationalMission for Sustainable Agriculture (NMSA)

(5) NGO: For IEC and coordinating among all stakeholders.



(ii) For New Projects

Urban Local Body within the scope of STP shall construct an overhead treated waste water tank with required capacity, with minimum 22m staging to create a head sufficient enough for water transmission for micro-irrigation purpose. The treated waste water is to be pumped from underground treated waste water sump (one hour capacity)/as required, by installation of required capacity pump sets with inbuilt starters in main panel. The work up to outlet of treated waste water overhead reservoir shall be the part of STP work. **For Existing/ under construction STPs** the above work can be taken up through Turn- key Contractor/ **Revenue Based Management Contract** (RBMC) operator.

The proposed micro-irrigation project shall have two parts:-

(1) ULB part: mains, sub-mains, flow meters, valves and other equipments to provide treated waste water up to the inlet of field of farmer.
(2) Farmer's part: field in which he shall install microcontroller-based drip irrigation system to get maximum yield in minimum water.

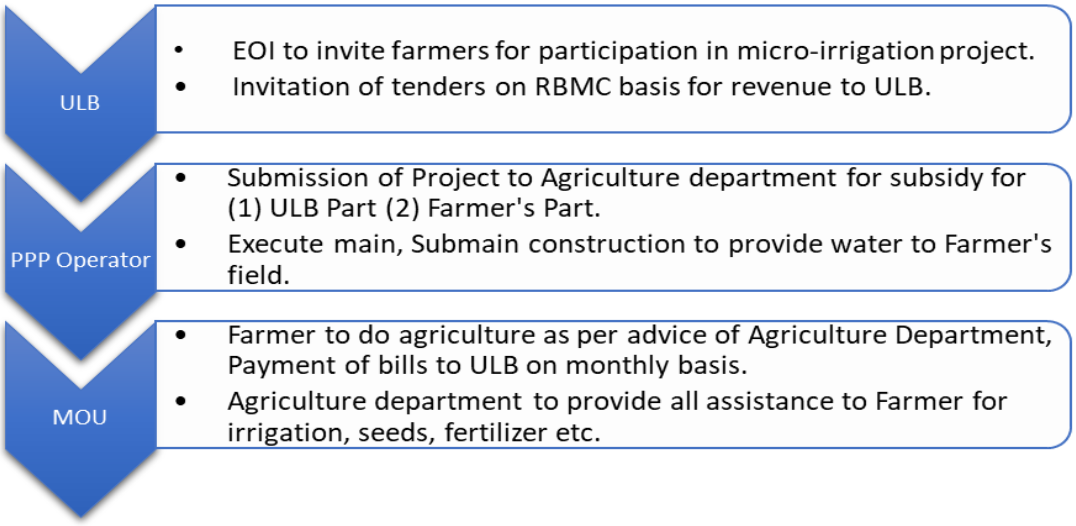
Urban local body will invite tenders on 'Revenue Based Management Contract' basis for development of microcontroller-based drip irrigation system. The scope of RBMC operator includes:

(1) Design and submission of complete project to Agriculture department, as per its guidelines, in the name of ULB to claim subsidy for ULB and assist farmers to claim subsidy, for installation of micro-irrigation project.
(2) After approval of the project from GoR, RBMC operator shall deposit required amount to ULB to be deposited to GoR to claim the subsidy in the name of ULB for main, sub-main partof micro-irrigation project.
(3) For subsidy to individual farmer RBMC operator shall assist farmer to complete formalities so that he may deposit the difference amount to GoR to claim subsidy for his field.
(4) Bear all the capital cost as well as recurring cost as required for the successful functioning of micro-irrigation system on ULB part.
(5) Installation of main-sub-main of required size to provide treated waste water at the inlet point of each field.
(6) Install and maintain flow meter at each outlet i.e., inlet point of field.
(7) Collect revenue as per bill bimonthly.

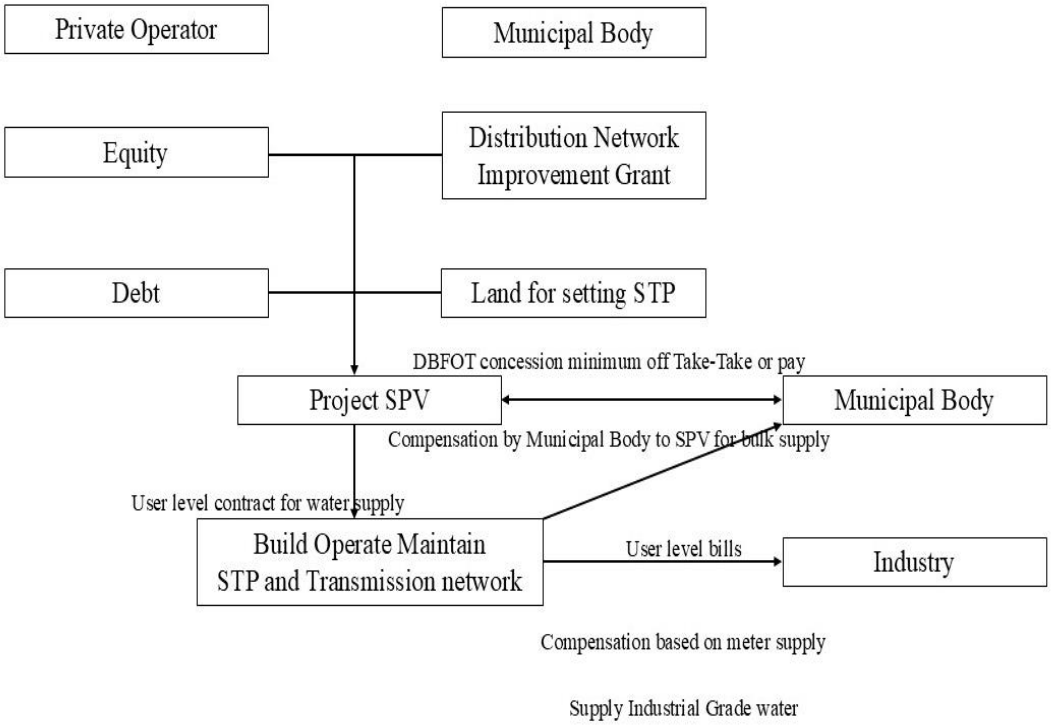
The subsidy claimed by ULB for mains and sub-mains including equipment's shall be transferred to RBMC operator as per progress of the work. The concessionaire shall be the bidder who shall provide maximum revenue to ULB in lieu of treated waste water per kl but not less than Rs. 3.00 per KL. The concession period may be 10 years to coincide with O&M period of STP.

Before inviting tenders on RBMC basis, ULB shall invite EOI from farmers for their participation in micro-irrigation. This will help in identifying farmers and their field area necessary for assessment by RBMC operator. An NGO may be appointed by ULB for encouraging farmers to participate in micro- irrigation project. The interested farmer will be assisted in preparation of individual project by RBMC operator to claim subsidy from GoR for installation of Microcontroller based drip irrigation system in their fields. Farmer has to sign a MOU with ULB, RBMC operator and Agriculture University to do agriculture as per the advice of Agriculture department / University so as to achieve maximum yield from his field.

Agriculture University/ Department shall provide training to farmers including continuous expertise and guidance for requirement of watering, fertilizer, soil condition, type of crop, seeds etc., so that farmer may get maximum benefit out of micro-irrigation project.



(C) Reuse for Industrial Purpose



All assets of the Project SPV to be transferred to Municipal Body at the end of the Concession Period.

DBFOT: Design Build Finance Operate Transfer

Other Business Models

Safe reuse of treated used water in industries Secondary treated used water from STPs has to be treated further to produce industry grade water for industry or industrial zone. The business models for SRTW in industry can be implemented in one of the following three approaches:

a) **Minimum guarantee and fixed price model**: The implementing agency enters into a long-term contract with an industry or industrial zone for bulk consumption of TWW at an agreed price. The implementing agency can set up a tertiary treatment unit and operate it on its own. Alternatively, if the implementing agency enters into a PPP arrangement for design, build and operations of the tertiary treatment unit to a private entity, they will be responsible to monitor compliance by the private entity to supply the agreed quantity of TWW to the bulk consumer. The implementing agency makes a net annuity payment to the private entity to ensure a guaranteed minimum revenue. The private entity responsible for treatment can sell additional TWW to other consumers.

b) **Reuse buy-back model:** An alternative arrangement is for the implementing agency to enter into a PPP arrangement with a private entity to develop and operate a tertiary treatment unit. The implementing agency pays a fixed O&M cost to the private entity and provides full buy back guarantee for TWW. The implementing agency is responsible to deliver TWW to the industries at a price fixed or as agreed with the industries.

c) **Reuse PPP model – investment by end user:** In this approach, the industry or industrial board purchases secondary TWW from the implementing agency. The industry or the industrial board is responsible for setting up the infrastructure for tertiary treatment and conveyance of the TWW at an agreed price to participating industries. Alternately the industry could contract operation and management of tertiary treatment unit to an agency and pay them a fixed O&M fee.

ULBs should adopt the most economic/beneficial approach for sale of Treated Waste Water to industries.

ANNEXURE-2: Best Practices of Rajasthan state

There are a few exemplary wastewater management projects in Rajasthan, which also promotes circular economy in Waste water and sludge management. Some are highlighted hereunder:

1. In Energy neutrality:

Dehlawas STP, Jaipur Municipal Corporation

Name of STP	Capacity (MLD)	Process	Present Status	Salient Features of Project
Dehlawas (215.00 MLD)	Unit-I (62.50) Unit-II (62.50) Unit-III (90.00)	SBR	Under O & M from Dec'2023	• Bio-gas Production in digesters – approx 10000 Nm3 per day • 2 Biogas Power Generation units each of 1.2 MW (8000) + Solar 1.5 MW (6000) total generating 14000 KWH/d against requirement of 31,000 KWH/d • Sale of Bio-gas to Brajdham Bottling Plant for CNG gas production - 6500 Nm3 per day @6.15 Rs per Nm^3 (Revenue-Rs 12 lac per month)

- Power requirement = 31000 KWH/day
- Power Generation potential of bio gas being sold = 13000 KWH/day.
- Energy generation Potential = 14000+13000 = 27000 KWH/day (87% of power requirement)

2. Innovations:

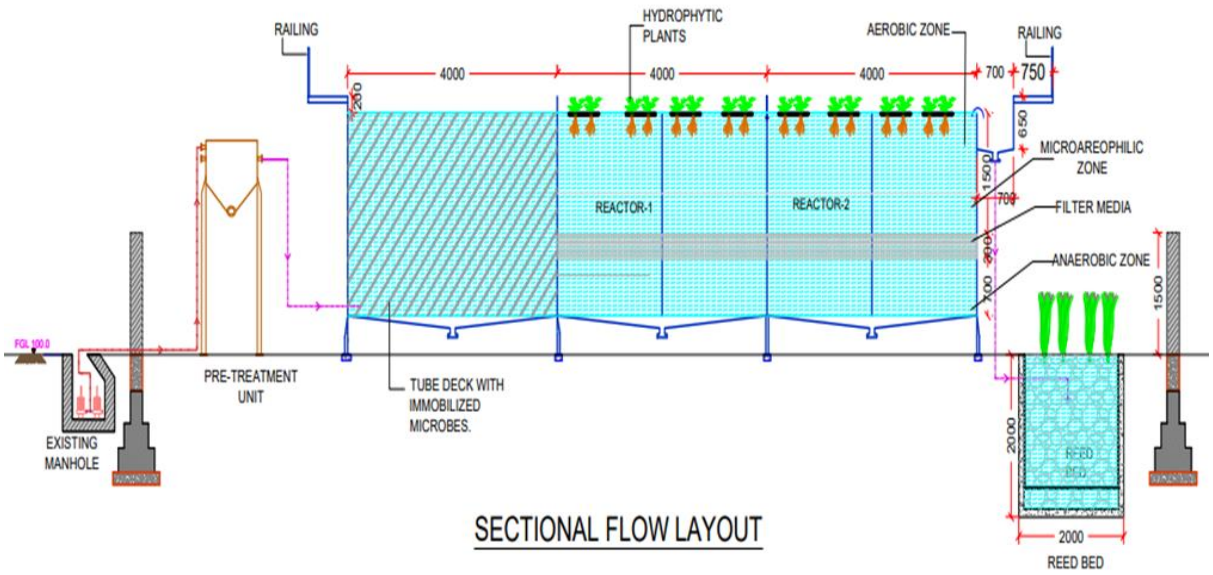
RUIDP-WWTP RUIDP-Technology:

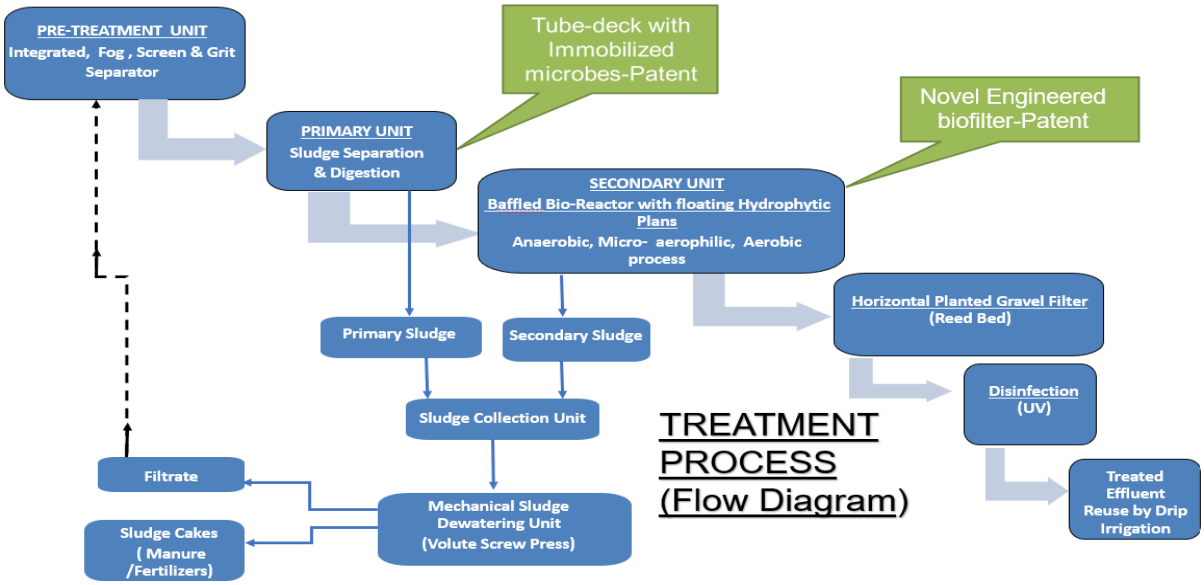
1. Patent has been granted to RUIDP for its WWTP "Process and Apparatus for treating Waste Water" on 8.8.2022.
   i. Utilizing standard WWTP treatment components (CPHEEO manual chapter 5)
   ii. Adding novelty to these components to enhance their performance.
2. Prototype apparatus is working at Stone Park, Mansarover, Jaipur
   i. 50 KLD capacity
   ii. Effluent parameters (BOD≤ 10 mg/l, COD≤50 mg/l, TSS≤10mg/l, TN≤10mg/l, TP≤1mg/l, Fecal Coliform≤100 MPN/100ml)
   iii. Prototype achieving guaranteed parameters successfully.
3. RUIDP has made patent "free" to be used by any organization/individual.

Components of RUIDP-WWTP:

1) **Pre-treatment unit-** Integrated coarse screen, fine screen, fog and grit separator unit
2) **Primary treatment unit-** Tube deck settler coated with immobilized strains of Bacteria
3) **Secondary treatment unit-** Baffled Bio-Reactor with Aerobic, Microaerophilic and Anaerobic treatment in one reactor.
4) **Tertiary treatment unit-** Disk filter followed by Reed bed
5) **Disinfection unit-** Ultra-violet rays disinfection system
6) **Sludge handling system-** Volute/screw type
7) **Automation-** PLC-SCADA
8) **Electricity consumption-** Solar panel
9) **Effluent monitoring system-** OCEMS and laboratory testing
10) **Reuse-** Drip irrigation

Sectional flow layout for RUIDP-WWTP is as below:





3. Reuse of treated used water based on PPP mode:

a) PPP Model-1

3 STPs- 25 MLD at Eklingpura, 10 MLD at FCI Godown, 5 MLD at Karjali House in Udaipur City were constructed based on HAM mode of PPP under Smart City Mission. Salient features of the project are as below:

Executing Agency	Udaipur Smart City Limited
Total Project Cost	Rs. 80 Crores
Concession Period	15 years
Executing Contracting Agency/Firm	M/s Hindustan Zinc Limited
Share Of ULB **Share Of HZL**	40% Of Project Cost – Rs. 32 Crore 60% Of Project Cost – Rs. 48 Crore
Construction linked payment	Payable after commissioning- 40% of 40% of the Project Cost i.e. Rs. 12.8 Crore
Annuities	Fifteen equal annuities of 60% of 40% of the project cost (=19.2/15) i.e. Rs 1.28 crore per annum
Revenue stream from HZL	Usage of 50% treated water for industrial use. Remaining 50% water shall be used to make Ayad river perennial.
Benefits	• Discharge of untreated sewage into water bodies eliminated • Treated effluent used for industrial resource use • Fresh water extraction reduced • Water quality improvement of Ayad River and conserving biodiversity

b) PPP Model - 2

10 MLD STP constructed by M/s Jindal Saw Ltd. at Bhilwara with following details:

- Entire Capex & Opex borne by M/s Jindal Saw Ltd.
- M/s Jindal Saw Ltd.
    - Pays INR 6.72 Cr. per annum to Bhilwara ULB
    - Rehabilitated 3 railway under pass and maintained these for 5 yrs.
    - Rights for industrial reuse with M/s Jindal Saw Ltd.
- ULB provided land for construction on lease of 20 years.

Same model is being replicated for another 10 MLD STP at Bhilwara.

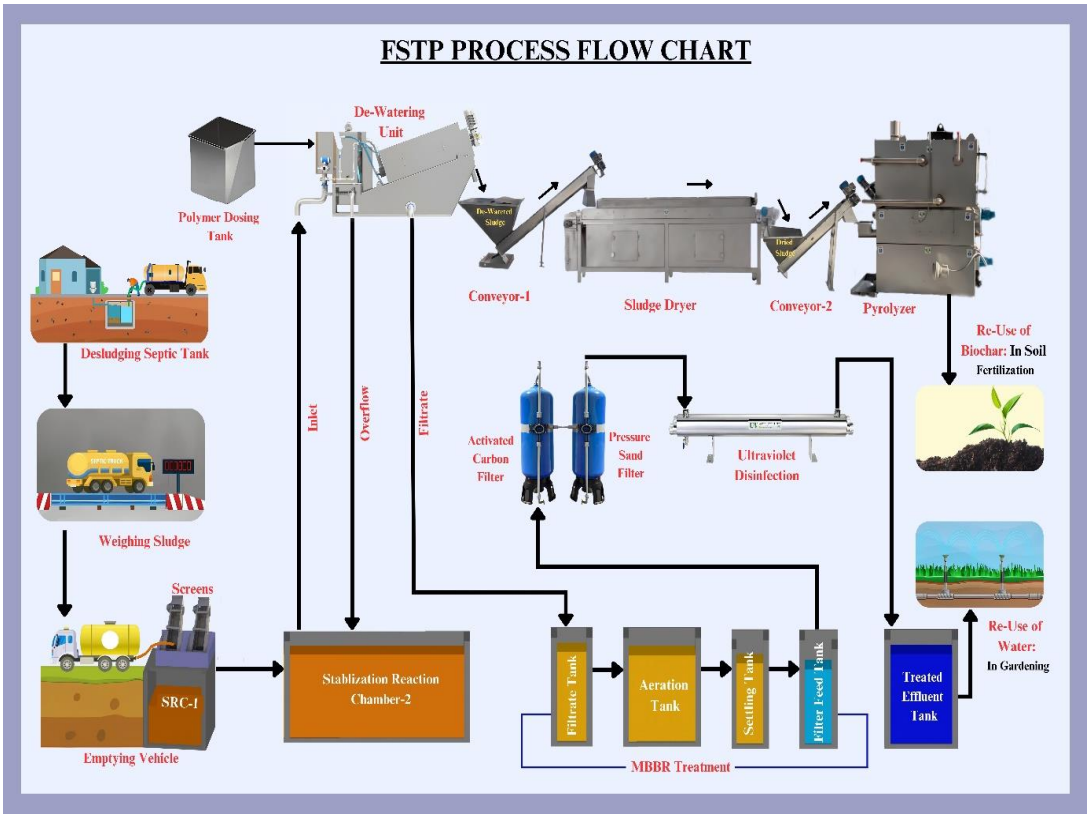
4. Fully Mechanized FSTPs:

15 KLD capacity Faecal Sludge Treatment Plant (FSTP) at Mukundgarh has been constructed to safely treat and manage faecal sludge and septage collected from onsite sanitation systems like septic tanks etc. They are using pyrolysis for sludge treatment for production of bio-char.

This Biochar have enriched nutrient content, excellent water retention capacity, and strong ability to improve soil structure. Its production process at the FSTP ensures that it is free from contaminants, making it a safe and sustainable option for agricultural and plantation needs.

Salient features of the project are as below-

Location	Latitude 27º57’11.43’’N, Longitude 75º13’25.45”E
Project Cost	9.20 cr
Executing Agency	Nagar Parishad, Mukundgarh (DLB)
Household covered	5000 Nos
Population benefitted	24106 people
Tankers emptied per day	1-2 Nos
Solar Plant Capacity	20 KW
Process used for treatment of sludge after solid liquid separation	Pyrolysis
Reuse of Treated water	For plantation within plant premises



Benefits: -

- Biochar produced at the FSTP is a unique, high-quality organic material rich in nutrients is used for the plantation within the plant premises, may be sold to farmers for enhancing soil fertility and improving crop yields.
- Use of chemical fertilizer will be reduced, which will also help in reduction of GHG emission.
- Prevents contamination of ground water from faecal sludge and septage.
- Minimized environmental impact and public health risks associated with untreated faecal sludge.

ANNEXURE-3: Rehabilitation of existing sewer network – different techniques

Rehabilitation of components of sewer systems is essential to ensure the overall systems as well as individual components performance. Additionally, the useful life of components can often be extended by timely action to correct either defects or deterioration resulting from various factors.

The rehabilitation activities can be driven by the need to improve the performance of the system or individual components in terms of: structural behaviour (e.g. increase of structural capacity); hydraulic behaviour (e.g. reduction of the roughness or of infiltration) and environmental behaviour (e.g. reduction of exfiltration of sewage to adjacent ground).

Sewer rehabilitation may be carried out **by renovation or by renewal** of the sewer. When the condition of the sewer is improved either to increase its carrying capacity or to increase its life, it is known as renovation. When the sewer line is reconstructed or replaced to the same dimensions as existing, it is known as renewal.

Condition assessment is the survey of existing sewer network in which sewer network is cleaned completely through diversion of flow, pumping, desilting. Evaluation of pipeline condition through inline Closed Circuit Television (CCTV) survey to assess the internal condition and material of the buried pipelines including accurate measurement of the length & diameter / cross section, invert levels and other physical attributes of buried pipelines, identification of all defects, joints and connections, measurement and recording of their location / position, sizes, & conditions of such pipelines as well as a report on the structural condition of the pipelines

CPHEEO's Manual on Sewerage and Sewage Treatment Systems (2013), provides details on different rehabilitation technologies as applicable to a range of conditions. Some of the most used technologies for rehabilitation of existing sewer line are as below:

1. Cured-In-Place-Pipe (CIPP):

Cured-In-Place Pipe (CIPP) lining is a trenchless technology used for renovation of existing pipelines. It involves inserting a flexible, resin-saturated liner into the damaged pipe and curing it to form a new, structural pipe within the old one. This results in a quick, simple and cost effective 'no dig' solution to costly pipe renewal with minimal disruption.

Process:

- **Inspection and Cleaning**: The existing pipe is inspected using cameras to assess its condition. It is then cleaned to remove debris and buildup.
- **Liner Insertion:** A felt or fiberglass liner, pre-saturated with a resin, is inserted into the pipe. This can be done through existing access points, minimizing the need for digging.
- **Curing:** The liner is then cured using heat, steam, or ultraviolet (UV) light. Once the resin hardens, it forms a new, seamless, and corrosion-resistant pipe within the old one.
- **Final Inspection**: After curing, the new liner is inspected to ensure it meets the required standards.

2. Machine Wound Spiral Lining (MWSL):

Machine Wound Spiral Lining (MWSL) is a trenchless technology used for renovation of existing pipelines.

Process:

- The process consists of feeding PVC profile through existing access points and winding the profile at a fixed diameter within the host pipe to form the liner.
- High compressive strength grout is then injected into any annular space to reinforce the structural integrity of the liner.

3. Pipe Bursting:

Pipe bursting is a trenchless sewer repair method that involves breaking and expanding the existing sewer line while simultaneously replacing it with new sewer line. This technique is an efficient way to replace a damaged, aging, or undersized sewer or water line, saving time and resources and causing minimal disruption.

Process:

- Pipe bursting is accomplished by pulling an expander head (also known as a "bursting head" or a "bullet") through the old pipe. The head is small enough to fit through the existing pipe, and it fractures the existing pipe as it is pulled through.
- The back of the head is connected to new pipe, which it drags and places behind it.
- A pulling machine is used to apply force. Power is supplied by a hydraulic system that is connected to pulling rods, which is in turn attached to the expander head.
- The pulling machine is lowered into the receiving pit, and the head begins its journey in the launching or insertion pit.

ANNEXURE-4: No-freshwater zone

This annexure provides guidance on implementation of no-freshwater zones. The cities may use these measures to encourage promotion of Treated Used Water. The measures should not discriminate against existing users of Treated Used Water and should be developed through a participatory process. A 'no-freshwater zone' demarcated by ULB, as decided in City Level Committee headed by District Collector, is to promote TWW and it shall have following features:

- The strict usage of TWW shall be applicable in the demarcated zone for industry, energy generation, construction, municipal uses and agriculture end use only. The usage of freshwater shall be for potable consumption only or other uses where a demonstrated need has been agreed.
- Groundwater and surface water permits will be issued and strictly monitored on their usage. The zone shall be applied to regions where groundwater is overexploited.
- The restriction on usage of freshwater shall not be applicable for households in the zone. There will be a penalty to households that sell freshwater extracted from the zone.
- Crops cultivated by farmers in the zone will be strictly regulated based on water availability and food safety considerations
- Where it has been agreed for viability reasons that freshwater is supplied in the zone, it will be priced higher than the regular price (except for households and other justifiable cases) and the pricing of TWW will be either based on pricing principles set out in the Policy or there may be incentives of lower pricing initially to make TWW attractive as decided by City Level Committee.

ANNEXURE-5: Technologies for Tertiary Treatment

In the existing plan of treating used water generated from domestic sources, which is mostly from households in the ULB, used water is treated to standards referred to as secondary treated used water (STW). In the case of TWW for reuse projects, the quality of treated water will vary based on the type of end use and the related standards prescribed. If the standards prescribed are more stringent than those for secondary treated used water, additional treatment modules/facility will need to be developed. Figure below indicates the incremental technology interventions required to achieve different end uses of TWW.

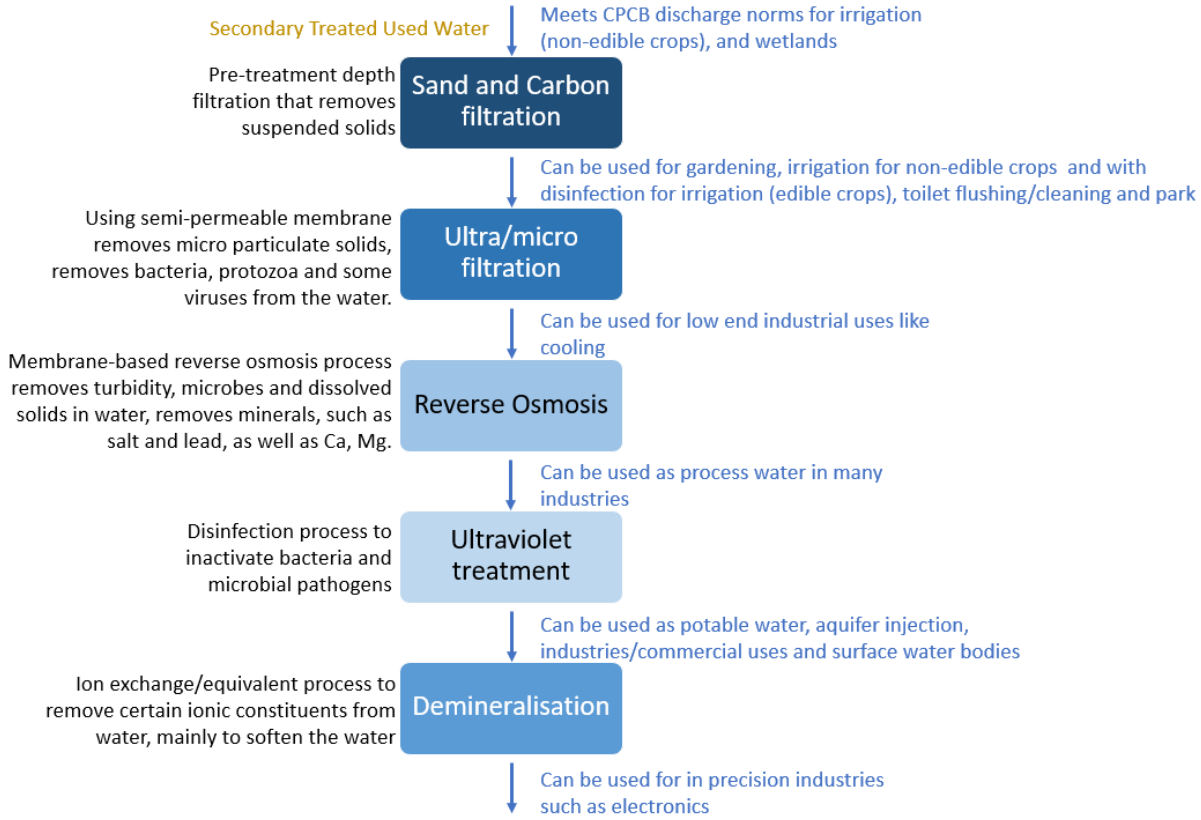


Figure: Incremental technology interventions to achieve end use water quality standards

CPHEEO's Manual on Sewerage and Sewage Treatment Systems (2013), provides details on different treatment technologies as applicable to a range of conditions. The manual provides details on the design considerations and operating requirements for the technologies based on type of end usage of TWW. A compendium of sewage treatment technologies and its assessment was prepared by Indian Institute of Technology, Kanpur and published by the National River Conservation Directorate, Ministry of Environment and Forests. The compendium provides information on the performance of treatment technologies implemented in the country and categorizes them according to performance, costs, energy and other resource requirements and land requirement. In case of RO & Deminerlisation process, reject should also be properly treated.

Technology for industrial reuse: The technology should meet industrial grade water and following advanced treatment technology are recommended:

1. Multi-grade filter, Dual Media Filter, Ultrafiltration

2. Multi-grade filter, Ultra Screen, UV system

3. Multi-grade filter, Ultra Screen, Ozonator

If the Secondary Treated Used Water has higher TDS (>1,000 ppm), Reverse Osmosis is suggested to be incorporated in each of the above system

Technology for agriculture end use: STW is suggested to disinfect with U-V or ozone. Alternately, including a maturation pond at the STP or at the farm level may also meet the requirement.

In addition to above list of technologies, the Swachh Bharat Committee periodically meets to review and approve technologies concerning sanitation. In selecting the technology, the implementing agency shall apply following principles: - Meets the required standards based on the intended purpose of SRTW - Low requirement of space - Low consumption on energy - Capital and operating cost should not make the project unviable

Source: National framework on safe reuse of treated water

ANNEXURE-6: Design Criteria for Sewerage System

Design criteria for sewerage system is elaborated in detail in Part A of "Manual on Sewerage and Sewage Treatment" published by CPHEEO, MoHUA, Government of India. Some of the basic principles for the design of sewerage system are as below:

1. DESIGN PERIOD:

The project components may be designed for the periods mentioned in Table 2-1 of CPHEEO manual overleaf.

S. No.	Component	Design Period, Years (From Base Year)
1	Land Acquisition	30 years or more
2	Conventional sewers (A)	30
3	Non-conventional sewers (B)	15
4	Pumping mains	30
5	Pumping Stations – Civil Work	30
6	Pumping Machinery	15
7	Sewage Treatment Plants	15
8	Effluent Disposal	30
9	Effluent Utilization	15 or as the case may be
(A) Typical underground sewers with manholes laid in the roads (B) All types such as small bore, shallow sewers, pressure sewers, vacuum sewers		

2. POPULATION FORECAST

The design population should be estimated by paying attention to all the factors governing the future growth and development of the project area in the industrial, commercial, educational, social, and administration spheres. Special factors causing sudden immigration or influx of population should also be predicted as far as possible.

A judgement based on these factors would help in selecting the most suitable method of deriving the probable trend of the population growth in the area or areas of the project from the following mathematical methods, graphically interpreted where necessary:

(A) Arithmetic Progression Method
(B) Geometric Progression Method
(C) Incremental Increase Method
(D) Graphical Increase Method
(E) Logistic Method
(F) Method of Density
(G) Demographic Method of Population Projection
(H) Decreasing Rate of Growth

Note: The worked-out examples for estimation of future population by some of the methods are given in Appendix A.2.2 of the Manual of Sewerage and Sewage Treatment, 2013.

3. PER CAPITA SEWAGE FLOW:

The flow in sewers varies from hour to hour and seasonally. However, for the purpose of hydraulic design estimated peak flows are adopted. The peak factor or the ratio of maximum to average flows depends upon contributory population as given in Table 3.2 of CPHEEO manual

Table 3.2 Peak factor for Contributory Population

Contributory Population	Peak Factor
up to 20,000	3.00
Above 20,001 to 50,000	2.50
Above 50,001 to 7,50,000	2.25
above 7,50,001	2.00

Estimate of flow in sanitary sewers may include certain flows due to infiltration of groundwater through joints. The design infiltration value shall be limited to a maximum of 10% of the design value of sewage flow.

The quantity of sewage and its characteristics show a marked range of hourly variation and hence peak, average and minimum flows are important considerations. The process loadings in the sewage treatment are based on daily average flows and the average characteristics from a 24 hour weighed composite sample.

The hydraulic design load varies from component to component of the treatment plant with all appurtenances, conduits, channels etc. being designed for the maximum flow which may vary from 2.0 to 3.5 times the average flow. Sedimentation tanks are designed on the basis of average flow, while consideration of both maximum and minimum flow is important in the design of screens and grit chambers.

4. MINIMUM SIZE OF CIRCULAR SEWERS

The minimum diameter may be adopted as 200 mm for cities having present / base year population of over 1 lakh. However, depending on growth potential in certain areas even 150 mm diameter can also be considered. However, in towns having present / base year population of less than 1 lakh, the minimum diameter of 150 mm shall be adopted.

In the case of hilly locations, the minimum diameter of 150 mm shall be adopted. The house sewer connection pipe to public sewer shall be (a) minimum 100 mm or higher based on the number of houses / flats connected and (b) subject to the receiving public sewer being of higher diameter.

5. FLOW IN CIRCULAR SEWERS

Gravity sewers shall be designed for the velocities as shown below to prevent deposition of suspended solids, organic matters in the sewer line and to prevent erosion of sewer line:

Table 3.9 Design velocities to be ensured in gravity sewers

No	Criteria	Value
1	Minimum velocity at initial peak flow	0.6 m/s
2	Minimum velocity at ultimate peak flow	0.8 m/s
3	Maximum velocity	3 m/s

Manning's Formula for Gravity Flow:

for circular conduits

$$V = (1/n)\left(3.968\times10^{-3}\right)D^{2/3}\,S^{1/2}$$

$$Q = (1/n)\left(3.118\times10^{-6}\right)D^{2.67}\,S^{1/2}$$

where,
Q : Discharge in l/s
S : Slope of hydraulic gradient
D : Internal diameter of pipe line in mm
R : Hydraulic radius in m
V : Velocity in m/s
n : Manning's coefficient of roughness

Design Depth of Flow:

The sewers shall not run full as otherwise the pressure will rise above or fall below the atmospheric pressure and condition of open channel flow will cease to exist. Moreover, from consideration of ventilation, sewers should not be designed to run full. In case of circular sewers, the Manning's formula reveals that:

• The velocity at 0.8 depth of flow is 1.14 times the velocity at full depth of flow.
• The discharge at 0.8 depth of flow is 0.98 times the discharge at full depth of flow.

Accordingly, the maximum depth of flow in design shall be limited to 0.8 of the diameter (i.e. d/D=0.8) at ultimate peak flow.

Slope of Sewer:

The minimum slopes in Table 3.13 of CPHEEO Manual shall be applicable:

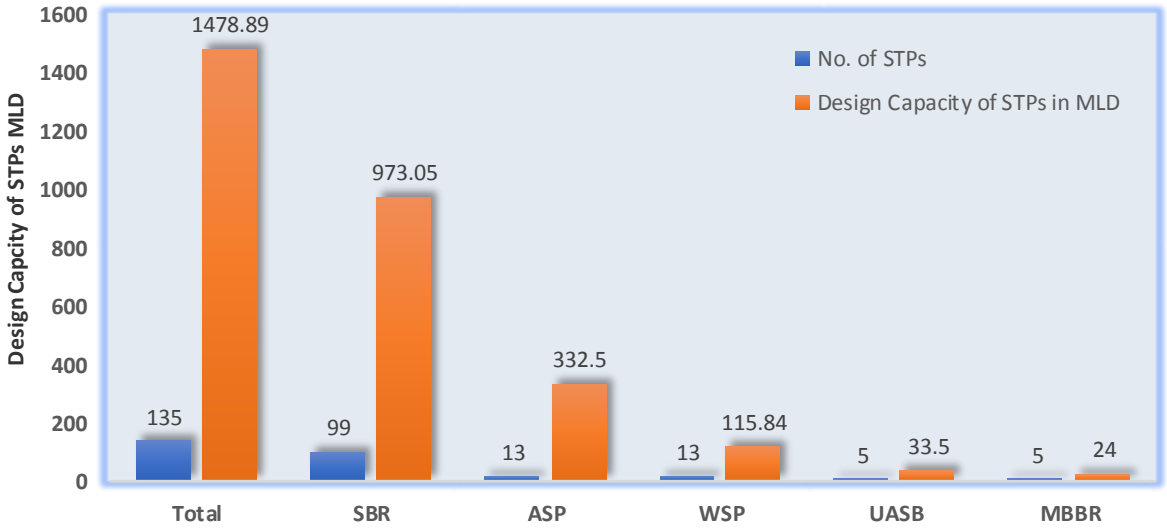
Table 3.13 Minimum slopes of sanitary sewers

Sewer Size (mm)	Minimum Slope		Sewer Size (mm)	Minimum Slope	
	As percent	As 1 in		As percent	As 1 in
150	0.6	170	375	0.15	670
200	0.40	250	450	0.12	830
250	0.28	360	≥525	0.10	1000
300	0.22	450			

ANNEXURE-7: Status of existing STPs and Sewerage coverage in Rajasthan State

With the current population of 85 million across the state, the urban population is substantial at 30% of the total population. Total wastewater generated in urban area of the state of Rajasthan is approximately 1649.95 MLD, however, amongst all ULBs in the state have 135 STPs of total capacity of 1478.89 MLD and 73 STPs (including 6 STPs under commissioning) of about 513.05 MLD capacity of waste water treatment plants are under construction/augmentation.

STP Technology	Total	SBR	ASP	WSP	UASB	MBBR
No. of STPs	**135**	99	13	13	5	5
Design Capacity in MLD	**1478.89**	973.05	332.50	115.84	33.50	24.00



List of Existing STPs:

S. No.	Name of Town	Location	STP Capacity (MLD)	Capacity being utilized (MLD)	Treatment Process
1	Ajmer	Khanpura	20.00	18.00	**ASP**
2	Ajmer	Aanasagar	13.00	12.00	**SBR**
3	Alwar	Bharatpur Road near Agyarah Dam	20.00	20.00	**ASP**
4	Badi Sadri	Near Mangri road	1.50	1.50	**SBR**
5	Balotra	Jerla	9.00	6.00	**SBR**
6	Banswara	Ghamaniya	6.43	4.90	**WSP**
7	Barmer	Village Kundla	10.00	4.93	**WSP**
8	Beawar	Near Vijay Nagar Private Bus Stand	5.00	3.15	**SBR**
9	Beawar	Near Narsingh pura	4.00	2.50	**SBR**
10	Beawar	Near Bichral Tank	1.50	1.20	**SBR**
11	Beawar	Kundan Nagar	1.00	0.60	**SBR**
12	Bhadra	Mahipalo ka mohalla	1.00	1.00	**SBR**

S. No.	Name of Town	Location	STP Capacity (MLD)	Capacity being utilized (MLD)	Treatment Process
13	Bhadra	Nathwana johad	3.50	2.70	**SBR**
14	Bharatpur	Gopal Nangla (Rundhikiran)	8.00	6.00	**SBR**
15	Bharatpur	Near existing STP at Ikran Village	5.00	5.00	**SBR**
16	Bhilwara	Kewada (J/sw)	10.00	10.00	**SBR**
17	Bhiwadi	RHB	1.50	1.50	**SBR**
18	Bhiwadi	Mundena Mev	2.00	1.00	**SBR**
19	Bhiwadi	Santhalka	3.00	2.08	**SBR**
20	Bhiwadi	Nr. Existing STP	3.00	2.32	**SBR**
21	Bhiwadi	Vasundhra Nagar (Bhiwadi)	4.00	3.00	**SBR**
22	Bikaner	Vallabgarden (Bikaner)	40.00	40.00	**SBR**
23	Bikaner	Sareh Nathania	12.00	12.00	**SBR**
24	Bikaner	Near Kali Mata Mandir Sujendarsar	20.00	12.66	**SBR**
25	Bundi	Devpura (Bundi)	8.00	8.00	**SBR**
26	Chirawa	Near Madela Road	3.00	2.20	**SBR**
27	Chirawa	Pilani Road	2.00	2.00	**SBR**
28	Chittorgarh	Pratappura (Bhoikhera) (Chitttorgarh)	5.00	4.00	**UASB**
29	Chittorgarh	Near Abhimanyu Park (Chitttorgarh)	3.00	2.00	**SBR**
30	Chittorgarh	Near Abhimanyu Park (Chitttorgarh)	2.00	2.00	**SBR**
31	Chittorgarh	Near Mukhyamantri Jan Awas Yojna (Chittorgarh)	1.00	0.58	**SBR**
32	Churu	Village Gajsar	7.00	6.50	**WSP**
33	Churu	B/W Cremation ground and Agarsen Nagar	1.00	1.00	**SBR**
34	Churu	TajusaTakiya (Churu)	2.50	2.50	**SBR**
35	Deedwana	Mela Maidan (Deedwana)	5.00	3.50	**SBR**
36	Dhoulpur	Tagawali	10.00	9.80	**UASB**
37	Dhoulpur	Shekhupur (Dholpur)	3.00	1.75	**SBR**
38	Fateh Nagar Sanwar	Changedi village (Fatehnagar Sanwar)	1.00	0.90	**SBR**
39	Fatehpur Shekhawati	Near Bari Road	7.50	6.00	**SBR**
40	Gangapur City	Near Jaipur Highway	5.50	3.50	**SBR**
41	Gangapur City	Near Jaipur Highway	2.50	1.81	**SBR**
42	Gangapur City	Aliganj Tiraha	1.50	1.00	**SBR**
43	Hanumangarh	Near Railway bridge over	5.00	4.30	**SBR**

S. No.	Name of Town	Location	STP Capacity (MLD)	Capacity being utilized (MLD)	Treatment Process
		Ghaggar river			
44	Hanumangarh	Jodkiya Phatak (Hanumangarh)	7.50	5.10	**WSP**
45	Hindaun City	Jaccha ki bawri	0.75	0.50	**SBR**
46	Hindaun City	Raghav das Bagichi	5.00	3.50	**SBR**
47	Jaipur	Brahmpuri STP (Jaipur)	8.00	8.00	**SBR**
48	Jaipur	Paladi Meena (Jaipur)	3.00	0.90	**SBR**
49	Jaipur	Central Park (Jaipur)	1.00	0.70	**MBBR**
50	Jaipur	Ralawta (Jaipur)	30.00	24.91	**ASP**
51	Jaipur	Gajdharpura (Jaipur)	30.00	27.62	**ASP**
52	Jaipur	Ram Niwas Bagh (Jaipur)	1.00	0.60	**MBBR**
53	Jaipur	Jawahar Circle (Jaipur)	1.00	0.50	**MBBR**
54	Jaipur	Swarnjayanti Park (Jaipur)	1.00	0.50	**MBBR**
55	Jaipur	Jaisingpura Highway	1.00	0.30	**SBR**
56	Jaipur	Kiro Ki Dhani (Jaipur)	1.00	0.50	**SBR**
57	Jaipur	Dravyawati River- PaniPech (Jaipur)	20.00	15.00	**SBR**
58	Jaipur	Dravyawati River- Mansarovar	15.00	12.00	**SBR**
59	Jaipur	Dravyawati River- Taruchya Nagar (Jaipur)	100.00	70.00	**SBR**
60	Jaipur	Dravyawati River- Pratap Nagar (Jaipur)	25.00	13.00	**SBR**
61	Jaipur	Dravyawati River- GONER(Jaipur)	10.00	5.00	**SBR**
62	Jaipur	Dehlawas unit II (Jaipur)	62.50	24.50	**SBR**
63	Jaipur	Jaisinghpura Khore (Jaipur)	50.00	50.00	**ASP**
64	Jaipur	Dehlawas unit I (Jaipur)	62.50	62.50	**SBR**
65	Jaisalmer	Kisanghat	10.00	7.00	**WSP**
66	Jaitaran	Near Karolia village (Jaitaran)	2.00	1.30	**SBR**
67	Jalore	Jalore	10.00	4.50	**WSP**
68	Jhalawar	Gagron Road (Jhalawar)	6.00	5.46	**ASP**
69	Jhalrapatan	Girdharpura (Jhalrapatan)	3.00	2.50	**ASP**
70	Jhunjhunu	Baggar Road Near Agrasen Circle	8.50	5.64	**UASB**
71	Jhunjhunu	Near Agrasen Circle	7.00	7.00	**SBR**
72	Jodhpur	Nandari (Jodhpur)	20.00	19.00	**WSP**
73	Jodhpur	Salawas Unit I (Jodhpur)	50.00	37.51	**ASP**
74	Jodhpur	Salawas Unit II (Jodhpur)	50.00	39.60	**ASP**
75	Karauli	Karauli	5.00	2.00	**UASB**
76	Kishangarh	Nasirabad Highway (Kishangarh)	10.00	6.50	**WSP**
77	Kota	Dhakarkhedi	20.00	17.82	**ASP**

S. No.	Name of Town	Location	STP Capacity (MLD)	Capacity being utilized (MLD)	Treatment Process
78	Kota	Sajidhera	30.00	22.73	**SBR**
79	Kota	Balita (Kota) (UIT)	30.00	30.00	**SBR**
80	Kota	Kala Talab (Kota)	15.00	12.00	**SBR**
81	Kushalgarh	Near Panchayat Samiti (Kushalgarh)	1.00	1.00	**SBR**
82	Laxmangarh	Indira Awas colony	1.50	0.80	**SBR**
83	Laxmangarh	Near Basin Road Banjara Basti	1.00	0.60	**SBR**
84	Laxmangarh	TodhiKui (Laxmangarh)	3.00	1.50	**SBR**
85	Makrana	Near Kidwai Stadium	6.00	5.20	**SBR**
86	Mt. Abu	Hetam Ji Village (Mt. Abu)	6.00	3.00	**ASP**
87	Nagaur	Balwa Road (Nagaur)	8.00	5.25	**WSP**
88	Nawalgarh	Near Bus stand (Nawalgarh)	3.00	2.10	**SBR**
89	Nawalgarh	Near Fire station (Nawalgarh)	1.00	0.60	**SBR**
90	Nimbahera	Near Shamshan Ghat, Kartana	2.00	1.89	**SBR**
91	Nimbahera	Kasod Basti Nalah (Nimbahera)	1.00	0.35	**SBR**
92	Nimbahera	Nimbahera Near Dashhera Maidan	4.50	1.30	**SBR**
93	Nokha	Ward No. 07 (Nokha)	1.00	1.00	**SBR**
94	Pali	Near ESI Hospital	7.50	2.50	**ASP**
95	Pali	Mandiya Industrial Area	15.00	13.80	**SBR**
96	Rajsamand	Rajsamand (Village Pratap pura)	5.00	3.00	**UASB**
97	Ramgarh Shekhawati	Shamshan ghat	2.00	1.40	**SBR**
98	Sardar Shahar	Sardar Shahar	5.00	2.00	**WSP**
99	Sardar Shahar	Sardar Shahar	2.00	0.45	**WSP**
100	Sawai Madhopur	Village Sorwal (Sawai Madhopur)	10.00	7.00	**WSP**
101	Sikar	Goshala land (Sikar)	2.00	1.20	**SBR**
102	Sikar	Near Shiv Colony (Sikar)	8.00	5.00	**SBR**
103	Sriganganagar	Suratgarh road (Sriganganagar)	10.00	8.00	**SBR**
104	Sujangarh	Gopal Gaushala on Thardaa Village	5.50	3.00	**SBR**
105	Sujangarh	Near Kalkanda (Sujangarh)	2.00	1.00	**SBR**
106	Sumerpur	Sumerpur	10.00	2.00	**WSP**
107	Suratgarh	Near subjail (Suratgarh)	2.50	1.60	**SBR**
108	Suratgarh	Adarsh Kalyan Bhumi near Anupgarh highway	2.50	1.80	**SBR**
109	Tonk	Tonk Molai Pura (Tonk)	16.00	8.00	**SBR**
110	Tonk	Tonk Dhaula Khera (Tonk)	4.00	2.00	**SBR**
111	Udaipur	Eklingpura (Udaipur)	20.00	14.58	**MBBR**

S. No.	Name of Town	Location	STP Capacity (MLD)	Capacity being utilized (MLD)	Treatment Process
112	Udaipur	Eklingpura (Udaipur)	25.00	25.00	**SBR**
113	Udaipur	FCI godown (Udaipur)	10.00	5.50	**SBR**
114	Udaipur	Kajrali house (Udaipur)	5.00	4.20	**SBR**
115	Kota	I L Township	2.00	1.80	**SBR**
116	Jaipur	Delhawas (khilari)	90.00	69.00	**SBR**
117	Kota	Balita Ladpura	6.00	4.00	**SBR**
118	Pratapgarh	Jain ghosal Kila Road	7.00	4.20	**SBR**
119	Bhilwara	Near Existing Jindal STP Kuwada	30.00	20.90	**SBR**
120	Gangapur City	Near Kushal Lake	1.50	0.50	**SBR**
121	Ajmer	Pushkar	3.50	3.50	**SBR**
122	Fatehpur Sekhawati	Fatehpur	4.30	3.80	**SBR**
123	Nathwara	Near Goverdhan Mountain	4.50	1.50	**SBR**
124	Sirohi	Nehru Nagar	5.00	1.00	**SBR**
125	Kota	Balita	15.00	2.90	**SBR**
126	Kota	Dhakarkhedi	40.00	11.35	**SBR**
127	Sujangarh	Gaushala on Salasar Road (Sujangarh)	1.5	0.5	**SBR**
128	Sujangarh	Chaptia pond near F.C.I. Godown (Sujangarh)	1.5	0.6	**SBR**
129	Jaipur	Chaugan Stadium (Jaipur)	1	0.8	**SBR**
130	Abu Road	Santpur (Abu Road)	6.9	3.37	**SBR**
131	Abu Road	Manpur (Abu Road)	2.3	1.4	**SBR**
132	Ajmer	Khanpura	40	17	**ASP**
133	Banswara	Ghamaniya, Udaipur Road	9.60	2.9	**SBR**
134	Ratangarh	Near NH-11 JOHAD	3.80	1.93	**SBR**
135	Mandawa	Mandawa	3.90	1.50	**SBR**
		Total	**1478.89**	**1124.98**	

Status of Sewerage (with in Municipal area) in Rajasthan

ULBs with population >1 lac being provided/provided partial sewerage coverage

S. No.	Name of ULBs	Population		Name of the Schemes/program ongoing/ Proposed*	% Coverage				Population Benefitted (year 2011)			Population benefitted (year 2024)
		As per Census 2011	Present 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/AMRUT 2.0/Own Resource	Total	
1	AJMER	542321	622492	RUIDP Ph I, JnNURM, Smart city, AMRUT, NRCB, AMRUT 2.0	78.00%	20.30%	98.30%	1.70%	423010	110091	533102	611910
2	ALWAR	322568	412392	RUIDP Ph II, AMRUT, AMRUT 2.0	37.62%	19.00%	56.62%	43.38%	121359	61288	182647	233508
3	BANSWARA	101017	128811	State Fund &RUIDP Ph IV	21.52%	78.48%	100.00%	0.00%	21739	79278	101017	128811
4	BARAN	117992	167817	AMRUT, AMRUT 2.0	0.00%	53.50%	53.50%	46.50%	0	63126	63126	89782
5	BEAWAR	151152	174626	AMRUT, AMRUT 2.0	55.41%	18.15%	73.56%	26.44%	83753	27434	111187	128455
6	BHARATPUR	252838	341472	RUIDP Ph II, AMRUT, AMRUT 2.0, RUIDP PH IV	42.00%	20.40%	62.40%	37.60%	106192	51579	157771	213079
7	BHILWARA	359483	515549	RUIDP Ph III, AMRUT 2.0	56.00%	22.20%	78.20%	21.80%	201310	79805	281116	403159
8	BHIWADI	104921	347629	AMRUT, AMRUT 2.0	36.63%	25.00%	61.63%	38.37%	38432	26230	64662	214242
9	BIKANER	644406	853222	RUIDP Ph I, UIDSSMT Ph I, RUIDP III, AMRUT, AMRUT 2.0	70.24%	10.00%	80.24%	19.76%	452631	64441	517071	684625
10	BUNDI	104919	134779	RUIDP Ph II, AMRUT, AMRUT 2.0	5.00%	84.00%	89.00%	11.00%	5246	88132	93378	119953
11	CHITTORGARH	116406	159917	RUIDP Ph II, AMRUT, AMRUT 2.0	21.00%	69.49%	90.49%	9.51%	24445	80891	105336	144709
12	CHURU	120157	151875	RUIDP Ph II, AMRUT, AMRUT 2.0	72.40%	18.17%	90.57%	9.43%	86993	21833	108825	137552
13	DHOLPUR	133075	179131	RUIDP Ph II, AMRUT 1.0, AMRUT 2.0	85.00%	10.00%	95.00%	5.00%	113114	13308	126421	170174
14	GANGAPURCITY	119090	164419	AMRUT, AMRUT 2.0	63.70%	14.52%	78.22%	21.78%	75860	17292	93152	128609
15	HANUMANGARH	150958	204699	UIDSSMT Ph I, RUIDP Ph III, AMRUT, AMRUT 2.0	85.00%	10.33%	95.33%	4.67%	128314	15594	143908	195140
16	HINDAUN CITY	105452	144029	AMRUT, AMRUT 2.0	57.00%	35.00%	92.00%	8.00%	60108	36908	97016	132507
17	JAIPUR GREATER	1827698	2668491	JDA, JMC, RHB, RIICO, JnNURM,RUIDP Ph I, AMRUT, AMRUT 2.0	82.49%	14.75%	97.24%	2.76%	2512804	449248	2962052	655915
18	JAIPUR HERITAGE	1218465	1778993									
19	JHUNJHUNU	118473	161136	UIDSSMT Ph I, RUIDP III, AMRUT, AMRUT 2.0	54.00%	10.17%	64.17%	35.83%	63975	12049	76024	103401
20	JODHPUR NORTH	538044	700215	JoDA, JoMC, RUIDP Ph I, UIDSSMT Ph I, AMRUT, AMRUT 2.0	83.57%	9.51%	93.08%	6.92%	882703	100426	983129	651778
21	JODHPUR SOUTH	518147	674321									
22	KISHANGARH	154886	212898	UIDSSMT Ph I, AMRUT, AMRUT 2.0	50.62%	17.00%	67.62%	32.38%	78403	26331	104734	143962
23	KOTA NORTH	614829	871304	RUIDP Ph I, UIDSSMT Ph I, NRCB, RUIDP Ph III, AMRUT, AMRUT 2.0	61.99%	10.00%	71.99%	28.01%	620992	100169	721162	627289
24	KOTA SOUTH	386865	548246									
25	MAKRANA	116295	113940	State Fund, RUIDP Ph IV	46.66%	35.00%	81.66%	18.34%	54263	40703	94966	93043
26	NAGAUR	105218	132128	RUIDP Ph II, AMRUT, AMRUT 2.0	60.00%	36.18%	96.18%	3.82%	63131	38068	101199	127081
27	PALI	230075	314967	UIDSSMT Ph I, RUIDP III, AMRUT 2.0	67.50%	20.00%	87.50%	12.50%	155301	46015	201316	275596

S. No.	Name of ULBs	Population		Name of the Schemes/program ongoing/ Proposed*	% Coverage				Population Benefitted (year 2011)			Population benefitted (year 2024)
		As per Census 2011	Present 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/AMRUT 2.0/Own Resource	Total	
28	SAWAI MADHOPUR	121106	180849	RUIDP Ph II & III, AMRUT 2.0	76.00%	6.84%	82.84%	17.16%	92041	8284	100324	149815
29	SHRIGANGANAG	237780	260861	State Fund, RUIDP III, AMRUT 2.0	70.00%	27.31%	97.31%	2.69%	166446	64938	231384	253844
30	SIKAR	244497	317945	AMRUT, AMRUT 2.0	25.95%	66.26%	92.21%	7.79%	63442	162004	225446	293170
31	SUJANGARH	101523	126699	AMRUT, AMRUT 2.0	77.00%	11.00%	88.00%	12.00%	78173	11168	89340	111495
32	TONK	165294	216212	RUIDP III, AMRUT 2.0	72.22%	19.27%	91.49%	8.51%	119375	31852	151227	197812
33	UDAIPUR	451100	571808	UIT, NLCP, Smart city, AMRUT, AMRUT 2.0	62.85%	12.00%	74.85%	25.15%	283516	54132	337648	427998

ULBs with population 50,000 to 1 lac being provided/provided partial sewerage coverage

S. No.	Name of ULBs	Population		Name of the Schemes/program ongoing/ Proposed*	% Coverage				Population Benefitted (year 2011)			Population benefitted (year 2024)
		As per Census 2011	Present 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	
1	ABU ROAD	55599	68775	RUIDP Ph IV	0.00%	99.00%	99.00%	1.00%	0	55043	55043	68087
2	BADI	62721	83899	State Fund	0.00%	12.52%	12.52%	87.48%	0	7850	7850	10500
3	BALOTRA	74496	102662	State Fund, RUIDP Ph IV	34.09%	33.90%	67.99%	32.01%	25398	25252	50650	69800
4	BARMER	96225	117983	RUIDP Ph II, RUIDP Ph IV	28.00%	66.65%	94.65%	5.35%	26943	64134	91077	111671
5	CHOMU	64417	85679	RUIDP Ph IV	0.00%	0.00%	0.00%	100.00%	0	0	0	0
6	DAUSA	85960	126349	RUIDP Ph IV	0.00%	0.00%	0.00%	100.00%	0	0	0	0
7	DIDWANA	53749	70523	State Fund, RUIDP Ph IV	42.00%	29.46%	71.46%	28.54%	22575	15834	38409	50396
8	FATEHPUR	92595	115082	State Fund, RUIDP Ph IV	42.33%	30.78%	73.11%	26.89%	39195	28501	67696	84136
9	JAISALMER	65471	91613	RUIDP Ph II	56.00%	0.00%	56.00%	44.00%	36664	0	36664	51303
10	JALORE	54081	71730	UIDSSMT Ph I	54.00%	0.00%	54.00%	46.00%	29204	0	29204	38734
11	JHALAWAR	66919	89462	RUIDP Ph II, RUIDP Ph IV, AMRUT, AMRUT 2.0	40.00%	25.11%	65.11%	34.89%	26768	16800	43568	58245
12	KARAULI	82960	109530	RUIDP Ph II	57.00%	0.00%	57.00%	43.00%	47287	0	47287	62432
13	KUCHAMAN	61969	82879	RUIDP Ph IV	0.00%	64.00%	64.00%	36.00%	0	39660	39660	53043
14	LADNU	65575	81379	RUIDP Ph IV	0.00%	77.00%	77.00%	23.00%	0	50493	50493	62662
15	LAXMANGARH	53392	64465	UIDSSMT (TP), State Fund	40.33%	45.36%	85.69%	14.31%	21534	24218	45752	55240
16	NAWALGARH	63948	76515	UIDSSMT (TP)	58.81%	0.00%	58.81%	41.19%	37609	0	37609	45000
17	NIMBEHEDA	61949	81320	UIDSSMT (TP)	75.00%	0.00%	75.00%	25.00%	46462	0	46462	60990

S. No.	Name of ULBs	Population		Name of the Schemes/program ongoing/ Proposed*	% Coverage				Population Benefitted (year 2011)			Population benefitted (year 2024)
		As per Census 2011	Present 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	
18	NOKHA	61969	86912	ULB, RUIDP Ph IV	68.06%	31.94%	100.00%	0.00%	42176	19793	61969	86912
19	RAJGARH (CHURU)	59193	74581		0.00%	0.00%	0.00%	100.00%	0	0	0	0
20	RAJSAMAND	67798	92352	RUIDP Ph II	25.00%	0.00%	25.00%	75.00%	16950	0	16950	23088
21	RATANGARH	71124	85364	RUIDP Ph IV	0.00%	82.00%	82.00%	18.00%	0	58322	58322	69998
22	SARDARSHAHA R	95911	117078	UIDSSMT, RUIDP Ph I, RUIDP Ph IV	40.00%	25.00%	65.00%	35.00%	38364	23978	62342	76101
23	SRI DUNGARGARH	53294	66604	State Fund	0.00%	0.00%	0.00%	100.00%	0	0	0	0
24	SURATGARH	70536	94532	UIDSSMT (TP)	42.31%	0.00%	42.31%	57.69%	29846	0	29846	40000

ULBs with population <50,000 being provided/provided partial sewerage coverage

S. No.	Name of ULBs	Population		Name of the Schemes/ program ongoing/ *Proposed	% Coverage				Population Benefitted			Population benefitted (year 2024)
		As per Census 2011	Projected 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0 /Own Resource	Total	
1	BADI SADRI	15713	17569	UIDSSMT (T)	100.00%	0.00%	100.00%	0.00%	15713	0	15713	17569
2	BHADRA	40662	50446	UIDSSMT (T)	60.46%	0.00%	60.46%	39.54%	24585	0	24585	30500
3	CHIRAWA	43953	57186	UIDSSMT (T)	52.46%	0.00%	52.46%	47.54%	23058	0	23058	30000
4	DUNGARPUR	47706	58132	RUIDP Ph IV (Heritage)	0.00%	35.00%	35.00%	65.00%	0	16697	16697	20346
5	FATEHNAGAR	22812	27949	UIDSSMT (TP)	37.00%	0.00%	37.00%	63.00%	8440	0	8440	10341
6	JAITARAN	22621	28993	UIDSSMT (TP)	100.00%	0.00%	100.00%	0.00%	22621	0	22621	28993
7	JHALRAPATAN	37506	49801	UIDSSMT Ph I	10.00%	0.00%	10.00%	90.00%	3751	0	3751	4980
8	KHETRI	18209	20312	RUIDP Ph IV (Heritage)	0.00%	79.00%	79.00%	21.00%	0	14385	14385	16046
9	KUSHALGARH	10666	12244	UIDSSMT (T)	100.00%	0.00%	100.00%	0.00%	10666	0	10666	12244
10	MANDAWA	23335	28882	RUIDP Ph IV (Heritage)	0.00%	91.00%	91.00%	9.00%	0	21235	21235	26283
11	MOUNT ABU	22943	27496	UIDSSMT Ph I, RUIDP III	76.50%	0.00%	76.50%	23.50%	17551	0	17551	21034
12	NAGAR	25572	33829	State Fund	0.00%	88.68%	88.68%	11.32%	0	22678	22678	30000
13	NATHDWARA	42016	51059	State Fund	50.00%	0.00%	50.00%	50.00%	21008	0	21008	25530
14	PRATAPGARH	42079	52588	RUIDP Ph IV	0.00%	100.00%	100.00%	0.00%	0	42079	42079	52588
15	RAMGARH SHEKHAWATI	33024	40101	UIDSSMT (TP)	100.00%	0.00%	100.00%	0.00%	33024	0	33024	40101
16	SIROHI	39229	47046	RUIDP Ph IV	0.00%	83.00%	83.00%	17.00%	0	32560	32560	39048
17	SUMERPUR	37093	50069	State Fund	30.00%	0.00%	30.00%	70.00%	11128	0	11128	15021
18	BILADA	39590	46175	State Fund	0.00%	75.80%	75.80%	24.20%	0	30009	30009	35000
19	PIPADCITY	36810	45074	State Fund	0.00%	70.77%	70.77%	29.23%	0	26051	26051	31900

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20	RAWATBHATA	37699	47698	State Fund	0.00%	23.14%	23.14%	76.86%	0	8722	8722	11035
21	SAGWARA	29439	36128	RUIDP Ph IV	0.00%	100.00%	100.00%	0.00%	0	29439	29439	36128
22	BANDIKUI	44664	53452	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
23	BAYANA	44368	48178		0.00%	0.00%	0.00%	100.00%	0	0	0	0
24	BEHRORE	29531	38254		0.00%	0.00%	0.00%	100.00%	0	0	0	0
25	BHUSAWAR	19946	24656		0.00%	0.00%	0.00%	100.00%	0	0	0	0
26	DEEG	44999	53624		0.00%	0.00%	0.00%	100.00%	0	0	0	0
27	JOBNER	11354	13112		0.00%	0.00%	0.00%	100.00%	0	0	0	0
28	KAMAN	38040	48565		0.00%	0.00%	0.00%	100.00%	0	0	0	0
29	KHAIRTHAL	38298	51669		0.00%	0.00%	0.00%	100.00%	0	0	0	0
30	KHERLI	17634	22930		0.00%	0.00%	0.00%	100.00%	0	0	0	0
31	KISHANGARH BAS	12429	16162		0.00%	0.00%	0.00%	100.00%	0	0	0	0
32	KUMHER	23540	29409		0.00%	0.00%	0.00%	100.00%	0	0	0	0
33	NADBAI	26411	35094		0.00%	0.00%	0.00%	100.00%	0	0	0	0
34	PILIBANGA	37288	47708		0.00%	0.00%	0.00%	100.00%	0	0	0	0
35	RAJGARH (ALWAR)	26631	34630		0.00%	0.00%	0.00%	100.00%	0	0	0	0
36	SAMBHAR	22327	23758		0.00%	0.00%	0.00%	100.00%	0	0	0	0
37	TIJARA	24747.00	31954		0.00%	0.00%	0.00%	100.00%	0	0	0	0
38	WARE	19385.00	23087		0.00%	0.00%	0.00%	100.00%	0	0	0	0
39	AAMET	17335	20262		0.00%	0.00%	0.00%	100.00%	0	0	0	0
40	AASIND	16611	20445		0.00%	0.00%	0.00%	100.00%	0	0	0	0
41	AKLERA	26240	35976		0.00%	0.00%	0.00%	100.00%	0	0	0	0
42	ANTAH	32377	46020		0.00%	0.00%	0.00%	100.00%	0	0	0	0
43	ANUPGARH	30877	39436		0.00%	0.00%	0.00%	100.00%	0	0	0	0
44	BAGGAD	14238	15375		0.00%	0.00%	0.00%	100.00%	0	0	0	0
45	BAGRU	31229	41649		0.00%	0.00%	0.00%	100.00%	0	0	0	0
46	BALI	19880	22654		0.00%	0.00%	0.00%	100.00%	0	0	0	0
47	BEGUN	20705	25337		0.00%	0.00%	0.00%	100.00%	0	0	0	0
48	BHAWANIMANDI	42283	56584		0.00%	0.00%	0.00%	100.00%	0	0	0	0
49	BHINDAR	17878	20677		0.00%	0.00%	0.00%	100.00%	0	0	0	0
50	BHINMAL	47932	61308		0.00%	0.00%	0.00%	100.00%	0	0	0	0
51	BIDASAR	35683	45781		0.00%	0.00%	0.00%	100.00%	0	0	0	0
52	BISSAU	23227	28116		0.00%	0.00%	0.00%	100.00%	0	0	0	0
53	CHAKSU	33432	44526		0.00%	0.00%	0.00%	100.00%	0	0	0	0
54	CHHABRA	32285	45098		0.00%	0.00%	0.00%	100.00%	0	0	0	0
55	CHHAPAR	19744	23792		0.00%	0.00%	0.00%	100.00%	0	0	0	0
56	CHOTI SADRI	18360	21482		0.00%	0.00%	0.00%	100.00%	0	0	0	0
57	DEGANA	20035	23681		0.00%	0.00%	0.00%	100.00%	0	0	0	0

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58	DEOGARH	17604	19848	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
59	DEOLI	22065	27655		0.00%	0.00%	0.00%	100.00%	0	0	0	0
60	DESHNOK	18470	22445		0.00%	0.00%	0.00%	100.00%	0	0	0	0
61	FALNA	24839	32796		0.00%	0.00%	0.00%	100.00%	0	0	0	0
62	GAJSINGHPURA	9995	11539		0.00%	0.00%	0.00%	100.00%	0	0	0	0
63	GANGAPUR	18777	22391		0.00%	0.00%	0.00%	100.00%	0	0	0	0
64	GULABPURA	27215	38989		0.00%	0.00%	0.00%	100.00%	0	0	0	0
65	INDARGARH	7444	9079		0.00%	0.00%	0.00%	100.00%	0	0	0	0
66	ITAWA	27344	34434		0.00%	0.00%	0.00%	100.00%	0	0	0	0
67	JAHAJPUR	20586	24795		0.00%	0.00%	0.00%	100.00%	0	0	0	0
68	KAITHOON	24260	31239		0.00%	0.00%	0.00%	100.00%	0	0	0	0
69	KANOR	13239	14904		0.00%	0.00%	0.00%	100.00%	0	0	0	0
70	KAPASAN	20869	24435		0.00%	0.00%	0.00%	100.00%	0	0	0	0
71	KAPREN	20748	26615		0.00%	0.00%	0.00%	100.00%	0	0	0	0
72	KEKRI	41890	54236		0.00%	0.00%	0.00%	100.00%	0	0	0	0
73	KESHAVRAIPATAN	24627	32143		0.00%	0.00%	0.00%	100.00%	0	0	0	0
74	KESRISIGHPUR	14010	16044		0.00%	0.00%	0.00%	100.00%	0	0	0	0
75	KHANDELA	29044	35067		0.00%	0.00%	0.00%	100.00%	0	0	0	0
76	KISHANGARHRENWAL	29201	35840		0.00%	0.00%	0.00%	100.00%	0	0	0	0
77	KOTPUTLI	49202	65353		0.00%	0.00%	0.00%	100.00%	0	0	0	0
78	KUCHERA	23468	30406		0.00%	0.00%	0.00%	100.00%	0	0	0	0
79	LAKHERI	29572	34329		0.00%	0.00%	0.00%	100.00%	0	0	0	0
80	LALSOT	34363	45642		0.00%	0.00%	0.00%	100.00%	0	0	0	0
81	LOSAL	28504	36267		0.00%	0.00%	0.00%	100.00%	0	0	0	0
82	MAHWA (DAUSA)	24846	33001		0.00%	0.00%	0.00%	100.00%	0	0	0	0
83	MALPURA	36028	34756		0.00%	0.00%	0.00%	100.00%	0	0	0	0
84	MANDALGARH	13844	17449		0.00%	0.00%	0.00%	100.00%	0	0	0	0
85	MANGROL	25073	31801		0.00%	0.00%	0.00%	100.00%	0	0	0	0
86	MERTA CITY	46070	59331		0.00%	0.00%	0.00%	100.00%	0	0	0	0
87	MUKUNDGARH	18469	21412		0.00%	0.00%	0.00%	100.00%	0	0	0	0
88	MUNDAWA	16871	19649		0.00%	0.00%	0.00%	100.00%	0	0	0	0
89	NAINWA	19485	24837		0.00%	0.00%	0.00%	100.00%	0	0	0	0
90	NAWA	22088	29341		0.00%	0.00%	0.00%	100.00%	0	0	0	0
91	NEEM KA THANA	36231	48835		0.00%	0.00%	0.00%	100.00%	0	0	0	0
92	NIWAI	37765	50797		0.00%	0.00%	0.00%	100.00%	0	0	0	0
93	NOHAR	49835	65437		0.00%	0.00%	0.00%	100.00%	0	0	0	0
94	PADAMPUR	18420	22316		0.00%	0.00%	0.00%	100.00%	0	0	0	0
95	PARBATSAR	15172	19313		0.00%	0.00%	0.00%	100.00%	0	0	0	0
96	PHALODI	49914	60712		0.00%	0.00%	0.00%	100.00%	0	0	0	0
97	PHULERA	26091	30927		0.00%	0.00%	0.00%	100.00%	0	0	0	0

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98	PIDAWA	12807	15154	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
99	PILANI	29741	36391		0.00%	0.00%	0.00%	100.00%	0	0	0	0
100	PINDWARA	24487	31260		0.00%	0.00%	0.00%	100.00%	0	0	0	0
101	POKARAN	23554	30984		0.00%	0.00%	0.00%	100.00%	0	0	0	0
102	PUSHKAR	21626	28902		0.00%	0.00%	0.00%	100.00%	0	0	0	0
103	RAISIGHNAGAR	28330	32983		0.00%	0.00%	0.00%	100.00%	0	0	0	0
104	RAJAKHEDA	33666	42778		0.00%	0.00%	0.00%	100.00%	0	0	0	0
105	RAJLDESAR	27419	34020		0.00%	0.00%	0.00%	100.00%	0	0	0	0
106	RAMGANJMANDI	41328	57286		0.00%	0.00%	0.00%	100.00%	0	0	0	0
107	RANI	13880	16867		0.00%	0.00%	0.00%	100.00%	0	0	0	0
108	RATANNAGAR	12841	15605		0.00%	0.00%	0.00%	100.00%	0	0	0	0
109	RAWATSAR	35102	42203		0.00%	0.00%	0.00%	100.00%	0	0	0	0
110	REENGUS	26139	33789		0.00%	0.00%	0.00%	100.00%	0	0	0	0
111	ROOPWAS	16515	18765		0.00%	0.00%	0.00%	100.00%	0	0	0	0
112	SADRI	27390	31914		0.00%	0.00%	0.00%	100.00%	0	0	0	0
113	SADULSAHAR	24980	31582		0.00%	0.00%	0.00%	100.00%	0	0	0	0
114	SALUMBAR	16425	18553		0.00%	0.00%	0.00%	100.00%	0	0	0	0
115	SANCHOR	32875	44592		0.00%	0.00%	0.00%	100.00%	0	0	0	0
116	SANGARIA	36619	45261		0.00%	0.00%	0.00%	100.00%	0	0	0	0
117	SANGOD	21846	27168		0.00%	0.00%	0.00%	100.00%	0	0	0	0
118	SARWAD	20372	26999		0.00%	0.00%	0.00%	100.00%	0	0	0	0
119	SHAHPURA (Bhilwara)	30320	35838		0.00%	0.00%	0.00%	100.00%	0	0	0	0
120	SHAHPURA (Jaipur)	33895	39243		0.00%	0.00%	0.00%	100.00%	0	0	0	0
121	SHEOGANJ	28053	32491		0.00%	0.00%	0.00%	100.00%	0	0	0	0
122	SOJATCITY	43023	42789		0.00%	0.00%	0.00%	100.00%	0	0	0	0
123	SRIKARANPUR	21297	23924		0.00%	0.00%	0.00%	100.00%	0	0	0	0
124	SRIMADHOPUR	31366	37968		0.00%	0.00%	0.00%	100.00%	0	0	0	0
125	SRI VIJAINAGAR	18425	21363		0.00%	0.00%	0.00%	100.00%	0	0	0	0
126	SURAJGARH	21666	26511		0.00%	0.00%	0.00%	100.00%	0	0	0	0
127	TAKHATGARH	16729	19320		0.00%	0.00%	0.00%	100.00%	0	0	0	0
128	TARANAGAR	32640	42529		0.00%	0.00%	0.00%	100.00%	0	0	0	0
129	TODABHEEM	22977	27999		0.00%	0.00%	0.00%	100.00%	0	0	0	0
130	TODARAISINGH	23559	29404		0.00%	0.00%	0.00%	100.00%	0	0	0	0
131	UDAIPURWATI	29236	35096		0.00%	0.00%	0.00%	100.00%	0	0	0	0
132	UNIARA	12551	15405		0.00%	0.00%	0.00%	100.00%	0	0	0	0
133	VIDHYAVIHAR	15644	19009		0.00%	0.00%	0.00%	100.00%	0	0	0	0
134	AJEETGARH	15414	20777		0.00%	0.00%	0.00%	100.00%	0	0	0	0
135	ATRU	11141	35117		0.00%	0.00%	0.00%	100.00%	0	0	0	0
136	BAHADURPUR	21112	27606		0.00%	0.00%	0.00%	100.00%	0	0	0	0
137	BALESARSATTA	10936	12755		0.00%	0.00%	0.00%	100.00%	0	0	0	0
138	BAMANWAS	13397	18496		0.00%	0.00%	0.00%	100.00%	0	0	0	0

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139	BANSUR	27354	35769	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
140	BARDOD	16434	21490		0.00%	0.00%	0.00%	100.00%	0	0	0	0
141	BARODA MEV	11893	15552		0.00%	0.00%	0.00%	100.00%	0	0	0	0
142	BASERI	22872	32519		0.00%	0.00%	0.00%	100.00%	0	0	0	0
143	BASNI	29187	42555		0.00%	0.00%	0.00%	100.00%	0	0	0	0
144	BASSI	26029	34713		0.00%	0.00%	0.00%	100.00%	0	0	0	0
145	BHOPALGARH	21895	25538		0.00%	0.00%	0.00%	100.00%	0	0	0	0
146	BONLI	15300	20328		0.00%	0.00%	0.00%	100.00%	0	0	0	0
147	BORAWAR	24975	30598		0.00%	0.00%	0.00%	100.00%	0	0	0	0
148	DANTARAMGARH	18344	24726		0.00%	0.00%	0.00%	100.00%	0	0	0	0
149	DHARIAWAD	11368	13949		0.00%	0.00%	0.00%	100.00%	0	0	0	0
150	GOVINDGARH	11552	15106		0.00%	0.00%	0.00%	100.00%	0	0	0	0
151	GUDHAGODJI	13369	16183		0.00%	0.00%	0.00%	100.00%	0	0	0	0
152	HAMEERGARH	12713	18090		0.00%	0.00%	0.00%	100.00%	0	0	0	0
153	JAWAL	10293	12336		0.00%	0.00%	0.00%	100.00%	0	0	0	0
154	JAYAL	16218	12447		0.00%	0.00%	0.00%	100.00%	0	0	0	0
155	KHAJUWALA	11654	14553		0.00%	0.00%	0.00%	100.00%	0	0	0	0
156	KHATUSHYAMJI	13499	15589		0.00%	0.00%	0.00%	100.00%	0	0	0	0
157	KOTKASIM	8538	11164		0.00%	0.00%	0.00%	100.00%	0	0	0	0
158	LALGARH JATAN	16629	20147		0.00%	0.00%	0.00%	100.00%	0	0	0	0
159	MANDAWAR	16485	19728		0.00%	0.00%	0.00%	100.00%	0	0	0	0
160	MANDAWARI	10798	14342		0.00%	0.00%	0.00%	100.00%	0	0	0	0
161	MARWAR JUNCTION	15880	18095		0.00%	0.00%	0.00%	100.00%	0	0	0	0
162	MANOHARPUR	20287	25631		0.00%	0.00%	0.00%	100.00%	0	0	0	0
163	NARAINA	15863	20042		0.00%	0.00%	0.00%	100.00%	0	0	0	0
164	NASIRABAD	50804	57983		0.00%	0.00%	0.00%	100.00%	0	0	0	0
165	NEEMRANA	15162	19826		0.00%	0.00%	0.00%	100.00%	0	0	0	0
166	PARTAPUR GARHI	10758	13117		0.00%	0.00%	0.00%	100.00%	0	0	0	0
167	PAOTA PRAGPURA	33031	41732		0.00%	0.00%	0.00%	100.00%	0	0	0	0
168	RAMGARH	33194	43164		0.00%	0.00%	0.00%	100.00%	0	0	0	0
169	RANIWADA	12598	16709		0.00%	0.00%	0.00%	100.00%	0	0	0	0
170	RISHABDEO	9171	11226		0.00%	0.00%	0.00%	100.00%	0	0	0	0
171	SAPOTRA	6716	9258		0.00%	0.00%	0.00%	100.00%	0	0	0	0
172	SARMATHURA	17988	24886		0.00%	0.00%	0.00%	100.00%	0	0	0	0
173	SEMARI	13327	16313		0.00%	0.00%	0.00%	100.00%	0	0	0	0
174	SIKRI	17148	20423		0.00%	0.00%	0.00%	100.00%	0	0	0	0
175	SIWANA	24387	33607		0.00%	0.00%	0.00%	100.00%	0	0	0	0
176	SULTANPUR	24273	31275		0.00%	0.00%	0.00%	100.00%	0	0	0	0
177	TAPOOKRA	9471	12385		0.00%	0.00%	0.00%	100.00%	0	0	0	0
178	THANAGAZI	13468	17513		0.00%	0.00%	0.00%	100.00%	0	0	0	0
179	TIBBI	13387	18153		0.00%	0.00%	0.00%	100.00%	0	0	0	0

S. No.	Name of ULBs	Population		Name of the Schemes/ program ongoing/ *Proposed	% Coverage				Population Benefitted			Population benefitted (year 2024)
		As per Census 2011	Projected 2024		Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0/Own Resource	Total	Balance Coverage	Existing	After completion of ongoing/ sanctioned projects State Fund/ RUIDP Ph IV/ AMRUT/ AMRUT 2.0 /Own Resource	Total	
180	UCCHAIN	22445	26732	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
181	VIJAINAGAR	32124	41718		0.00%	0.00%	0.00%	100.00%	0	0	0	0
182	VIRAT NAGAR	20568	26621		0.00%	0.00%	0.00%	100.00%	0	0	0	0
183	LAXMANGARH	26103	69429		0.00%	0.00%	0.00%	100.00%	0	0	0	0
184	AHORE	16867	22016		0.00%	0.00%	0.00%	100.00%	0	0	0	0
185	AKOLA	11049	14422		0.00%	0.00%	0.00%	100.00%	0	0	0	0
186	ARNOD	6598	8612		0.00%	0.00%	0.00%	100.00%	0	0	0	0
187	BAAP	10393	13566		0.00%	0.00%	0.00%	100.00%	0	0	0	0
188	BASAVA	15532	20274		0.00%	0.00%	0.00%	100.00%	0	0	0	0
189	BHADAREJ	19058	24876		0.00%	0.00%	0.00%	100.00%	0	0	0	0
190	BHIM	12814	16726		0.00%	0.00%	0.00%	100.00%	0	0	0	0
191	BHUHANA	10495	13699		0.00%	0.00%	0.00%	100.00%	0	0	0	0
192	BIGOD	18453	24086		0.00%	0.00%	0.00%	100.00%	0	0	0	0
193	BIJOLIYA	14140	18457		0.00%	0.00%	0.00%	100.00%	0	0	0	0
194	BNERA	11436	14927		0.00%	0.00%	0.00%	100.00%	0	0	0	0
195	CHOHTAN	12465	16270		0.00%	0.00%	0.00%	100.00%	0	0	0	0
196	DAG	13935	18189		0.00%	0.00%	0.00%	100.00%	0	0	0	0
197	DAI	12884	16817		0.00%	0.00%	0.00%	100.00%	0	0	0	0
198	DHOD	12032	15705		0.00%	0.00%	0.00%	100.00%	0	0	0	0
199	DHORIMANNA	10036	13100		0.00%	0.00%	0.00%	100.00%	0	0	0	0
200	DIGGI	11070	14450		0.00%	0.00%	0.00%	100.00%	0	0	0	0
201	DUDU	15816	20644		0.00%	0.00%	0.00%	100.00%	0	0	0	0
202	DUNDLAUD	11305	14756		0.00%	0.00%	0.00%	100.00%	0	0	0	0
203	DUNI	11295	14743		0.00%	0.00%	0.00%	100.00%	0	0	0	0
204	GADSANA	24486	31961		0.00%	0.00%	0.00%	100.00%	0	0	0	0
205	GOLUWALA	21313	27820		0.00%	0.00%	0.00%	100.00%	0	0	0	0
206	GUDDA MALANI	9798	12789		0.00%	0.00%	0.00%	100.00%	0	0	0	0
207	HINDOLI	12186	15906		0.00%	0.00%	0.00%	100.00%	0	0	0	0
208	JAKHAL	7007	9146		0.00%	0.00%	0.00%	100.00%	0	0	0	0
209	JASOL	13274	17326		0.00%	0.00%	0.00%	100.00%	0	0	0	0
210	KALADERA	13151	17166		0.00%	0.00%	0.00%	100.00%	0	0	0	0
211	KHANPUR	17617	22995		0.00%	0.00%	0.00%	100.00%	0	0	0	0
212	KHATU KHURD	11202	14622		0.00%	0.00%	0.00%	100.00%	0	0	0	0
213	KHEJROLI	19233	25105		0.00%	0.00%	0.00%	100.00%	0	0	0	0
214	LAMBA HARI SINGH	8383	10942		0.00%	0.00%	0.00%	100.00%	0	0	0	0
215	LAWAN	12658	16522		0.00%	0.00%	0.00%	100.00%	0	0	0	0
216	MALAKHEDA	11529	15049		0.00%	0.00%	0.00%	100.00%	0	0	0	0
217	MALSISAR	13719	17907		0.00%	0.00%	0.00%	100.00%	0	0	0	0
218	MANDAN	9695	12655		0.00%	0.00%	0.00%	100.00%	0	0	0	0
219	MANDAR	13930	18183		0.00%	0.00%	0.00%	100.00%	0	0	0	0

S. No.	Name of ULBs	Population		Name of the Schemes/ program ongoing/ *Proposed	% Coverage				Population Benefitted			Population benefitted (year 2024)
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220	MANDRAYAL	8590	11212	From own resource/ assistance from any financial institution viz HUDCO	0.00%	0.00%	0.00%	100.00%	0	0	0	0
221	MANDRELLA	15074	19676		0.00%	0.00%	0.00%	100.00%	0	0	0	0
222	MANIA	13740	17935		0.00%	0.00%	0.00%	100.00%	0	0	0	0
223	MANOHAR THANA	11292	14739		0.00%	0.00%	0.00%	100.00%	0	0	0	0
224	MASUDA	10653	13905		0.00%	0.00%	0.00%	100.00%	0	0	0	0
225	MATHANIA	15902	20757		0.00%	0.00%	0.00%	100.00%	0	0	0	0
226	MAWALI	11617	15164		0.00%	0.00%	0.00%	100.00%	0	0	0	0
227	MERTA ROAD	17851	23301		0.00%	0.00%	0.00%	100.00%	0	0	0	0
228	NARAYANA	15863	20706		0.00%	0.00%	0.00%	100.00%	0	0	0	0
229	NARAYANPUR	25818	33700		0.00%	0.00%	0.00%	100.00%	0	0	0	0
230	NOGAV	10797	14093		0.00%	0.00%	0.00%	100.00%	0	0	0	0
231	PAHADI	8363	10916		0.00%	0.00%	0.00%	100.00%	0	0	0	0
232	PALSANA	13186	17211		0.00%	0.00%	0.00%	100.00%	0	0	0	0
233	PIPLU	7574	9886		0.00%	0.00%	0.00%	100.00%	0	0	0	0
234	PISAGAN	15471	20194		0.00%	0.00%	0.00%	100.00%	0	0	0	0
235	RAMGARH PACHWARA	7954	10382		0.00%	0.00%	0.00%	100.00%	0	0	0	0
236	RIYABADI	12289	16041		0.00%	0.00%	0.00%	100.00%	0	0	0	0
237	SAHAWA	14860	19397		0.00%	0.00%	0.00%	100.00%	0	0	0	0
238	SAMDARI	17590	22960		0.00%	0.00%	0.00%	100.00%	0	0	0	0
239	SAWAR	20372	26591		0.00%	0.00%	0.00%	100.00%	0	0	0	0
240	SAYAL	18238	23806		0.00%	0.00%	0.00%	100.00%	0	0	0	0
241	SEPAU	11392	14870		0.00%	0.00%	0.00%	100.00%	0	0	0	0
242	SIKARAY	10612	13852		0.00%	0.00%	0.00%	100.00%	0	0	0	0
243	SINDHARI	10145	13242		0.00%	0.00%	0.00%	100.00%	0	0	0	0
244	SINGHANA	11372	14844		0.00%	0.00%	0.00%	100.00%	0	0	0	0
245	SISWALI	14991	19568		0.00%	0.00%	0.00%	100.00%	0	0	0	0
246	SOJAT ROAD	18932	24712		0.00%	0.00%	0.00%	100.00%	0	0	0	0
247	SUKET	22328	29144		0.00%	0.00%	0.00%	100.00%	0	0	0	0
248	SULTANA	16623	21698		0.00%	0.00%	0.00%	100.00%	0	0	0	0
249	SUROTH	13780	17987		0.00%	0.00%	0.00%	100.00%	0	0	0	0
250	TANTOTI	5104	6662		0.00%	0.00%	0.00%	100.00%	0	0	0	0
251	TIVRI	18267	23844		0.00%	0.00%	0.00%	100.00%	0	0	0	0
252	VAJIRPUR	15515	20252		0.00%	0.00%	0.00%	100.00%	0	0	0	0
253	VALLABHANAGR	11043	14414		0.00%	0.00%	0.00%	100.00%	0	0	0	0
254	VATIKA	10590	13823		0.00%	0.00%	0.00%	100.00%	0	0	0	0
255	WEIR	19385	25303		0.00%	0.00%	0.00%	100.00%	0	0	0	0

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